PCT/AU01/00774

Patent Office
Canberra

I, GAYE TURNER, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PQ 8476 for a patent by WESTFIELD LIMITED filed on 30 June 2000.

WITNESS my hand this
Twenty-third day of July 2001

GAYE TURNER
TEAM LEADER EXAMINATION
SUPPORT AND SALES

AUSTRALIA

Patents Act 1990

Westfield Limited

PROVISIONAL SPECIFICATION

Invention Title:

Internet shopping mall

The invention is described in the following statement:

Internet shopping mall

Introduction

The present invention relates generally to the field of e-commerce and in particular the invention provides a web site structure and a method of building a web site for an internet shopping mall in which a number of different and independent retailers are represented on web pages produced on the shopping mall site but under each retailers individual control.

Background

Prior art web sites that linked different retail services were initially simply web pages with links through to independent retailer web sites, however this mechanism did not allow any aggregation of services at the mall site.

Subsequent improvements to such sites involved passing information between the Mall site and the retailer site to enable checkout functions to appear to be aggregated at the mall site but in fact the transaction details were sent back to the individual retailers who then performed the financial transactions with an appropriate bureau and arranged delivery. Such sites still did not provide any aggregation of services other than checkout services and provision of a pseudo-shopping cart to enable the purchaser to collect items from one or more retailers before completing the purchases. Further the building of the retailer site was done by the retailer and no integration of the pages of the Mall and retailer sites was possible.

Some, more recent, sites have been created which collect together retail services that would have previously been provided by different retailers (eg. Books and Hardware) and provided the services in different pseudo-stores on the "Mall" site but in effect the retail services were all provided by the one provider and the design and construction of the web pages of the individual pseudo-stores were all performed centrally by the mall site operator.

Summary of the invention

According to a first aspect the present invention consists in a method of building a web page on a first internet site operated by a first computer system where the page is an amalgamation of elements from at least two sources including a first and second source where the elements from the first source comprise elements common to a plurality of pages on the first internet site and the second source is a second computer system operating a second

independent internet site, the page being defined by template components which specify format and data items defining detail in respective page elements, the method comprising the steps of:

a) when the page is requested by a user accessing the first internet site, obtaining a page-template component supplied from a template storage means on the first computer system, the first page-template component defining locations on the page for placement of data items from a first items database associated with the first internet site;

b) combining the first page-template component with a second page-template component supplied from a template component storage means on the second computer system, the second page-template component defining locations on the page for placement of data items from a second items database associated with the second internet site;

c) obtaining first data items associated with the first page-template component from the first database and inserting the first data items into the page at the locations defined by the first page-template component;

d) obtaining second data items associated with the second page-template component from the second database and inserting the second data items into the page at the locations defined by the second page-template component; and

e) providing the page to the user.

According to a second aspect, the present invention consists in a method of building a web page on an internet site where the page is an amalgamation of page defining elements including at least two template elements defining page format of respective page components of the web page and data items defining detail in respective page elements, the method comprising the steps of:

a) when the page is requested by a user accessing the internet site, obtaining a page-template component supplied from a template storage means, the first page-template component defining locations on the page for placement of data items from a first items database associated with the internet site;

b) combining the first page-template component with a second page-template component supplied from a template component storage means, the second page-template component defining locations on the page for

placement of data items from a second items database associated with an information provider other than the internet site;

c) obtaining first data items associated with the first page-template component from the first database and inserting the first data items into the page at the locations defined by the first page-template component;

d) obtaining second data items associated with the second page-template component from the second database and inserting the second data items into the page at the locations defined by the second page-template component; and

e) providing the page to the user.

According to a third aspect, the present invention consists in a telecommunication signal representing an internet web page image generated by a web site and comprising an amalgamation of at least two page components, the amalgamated page image being produced by the web site from a first page-template component and a second page-template component, the page-template components each defining locations on the page for placement of data items from respective databases associated with each template component.

Preferably the components which make up the signal are obtained as follows:

a) the first page-template component is supplied from a template storage means, the first page-template component defining locations on the page for placement of data items from a first items database;

b) the second page-template component is supplied from a template component storage means, the second page-template component defining locations on the page for placement of data items from a second items database;

c) the first data items associated with the first page-template component are obtained from the first database and one inserted into the page at the locations defined by the first page-template component;

d) the second data items associated with the second page-template component are obtained from the second database and are inserted into the page at the locations defined by the second page-template component.

In preferred embodiments of the invention, cache means are provided in the first computer system whereby, for pages that are requested often by users, the second page-template component is temporarily stored in the

cache means, the second page-template component being retrieved from the cache if it is currently held in the cache and otherwise being retrieved from the template storage means in the second computer system. The cache means is preferably a pre-emptive cache whereby the pages are pre-fetched and periodically updated in anticipation of users requesting them, however it is also possible to use a non-preemptive cache in which case the second page-template component is temporarily stored in the cache means when the page is requested for a first time and is flushed from the cache if the page is not requested again within a period of time determined by the first computer system.

The second database is preferably located locally to the first computer system and is a copy of a third database held remotely of the first computer system, the second database being updated intermittently to reflect data changes that have occurred on the third data base.

The second page-template component comprises a page template of the second internet site, and the first page-template component is a component used to add content relating to the shopping mall site, the first page-template component, when combined with the second page-template component forming a border along a side of an information carrying portion of the second page-template component and the second page-template component being resized if necessary to produce a page that fits within a page dimension specification of the first internet site.

The first page-template component defines layout of a first page component, and content relevant to the first page-template component is preferably defined by a first content database, which is separate from the first items database, the content of the first content database comprising at least one display element and the data items of the first items database providing details of the display elements provided from the first content database.

The second page-template component defines a layout of a second page component, and content relevant to the second page component is preferably defined by a second content database separate from the second items database, the content of the second content database comprising at least one display element and the data items of the second database providing details of the display elements provided from the second content database.

Alternatively it is also possible to define a page by having each of the page-template components define layout and content of a respective component of a page, where the content includes at least one display element and the data items of the first and second databases provide details of the display elements for the first and second page-template components respectively.

In yet another possible arrangement, each of the page-template components define only layout of a respective component of a page and the first and second items databases provide content items for each respective page component and data items for each respective content item.

According to a further aspect, the present invention provides a method of managing one or more transactions via an internet shopping mall the method comprising providing:

a data object representing a virtual shopping cart, the data object storing a single shopper identification and one or more purchase item identifications one for each item currently selected for possible purchase, the data item identifications including a unique identifier for each item and an identifier indicating the retailer from whom for the sale was made;

a user first interface to present to a user, via a first web page, information allowing identification of the items in the data object and including a price for each item, the information being sorted by names of retailers from which the items are to be purchased and the description of goods represented by the item;

control means provided via the web page for moving items between the shopping cart data object and objects representing other goods registers associated with the user, and for progressing the transaction to a checkout phase;

a checkout system for performing the checkout phase and including a second user interface to present checkout information to the user via a second web page, the checkout information including the product information allowing identification of the goods to be purchased and the price:

control means, provided via the second web page for verifying the items to be purchased and enabling specification by the user of transaction parameters to be used by a transaction fulfilment server to complete the transaction, whereby the user may select goods for purchase from a plurality

of retailers present on the Internet Shopping Mall and the data object representing the virtual shopping cart manages the potential purchases until they are presented to the checkout.

According to yet a further aspect, the present invention provides a internet shopping mall in which a plurality of marketing services are aggregated over a plurality of independent retailers integrally represented on the Internet Shopping Mall Site.

According to still a further aspect, the present invention provides a internet shopping mall in which user profile are maintained s by incrementally adjusting each user profile in accordance with known characteristics of site pages visited and products purchased.

According to still a further aspect, the present invention provides a internet shopping mall in which product profile are maintained s by incrementally adjusting each product profile in accordance with known characteristics of users purchasing the product , viewing the details of the product or visiting the site page on which the product is displayed.

According to yet a further aspect, the present invention provides a internet shopping mall in which Transaction Fulfilment services to a user are aggregated over a plurality of independent retailers integrally represented on the Internet Shopping Mall Site, such that purchases from a plurality of retailers may be completed in a single set of operations on the Internet Shopping Mall and delivery services are aggregated for a plurality of purchased goods. In a preferred embodiment Warehousing and packing functions are also aggregated.

Brief Description of the Drawings

Embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a high level block diagram of the overall structure of a Internet Shopping Mall according to the present invention;

Figure 2 is a block diagram showing the functional structure of an Internet Shopping Mall according to the present invention;

Figure 3 is a block diagram showing the integration structure of the Mall Site of Figures 1 and 2;

Figure 4 is a block diagram illustrating a shop building function within the Internet Shopping mall of Figures 1, 2 and 3;

Figure 5 is a block diagram illustrating a possible hardware configuration for the Internet Shopping Mall of Figures 1, 2, 3 and 4;

Figure 6 is a block diagram illustrating a possible logical configuration for the Internet Shopping Mall of Figures 1, 2, 3 and 4; and

Figure 7 illustrates an example of a retailer webpage.

Detailed Description of the Preferred Embodiment

In a preferred embodiment of the invention, an Internet Shopping Mall is provided, in which multiple retailers will be aggregated under the one banner of the Mall operator. This site includes a number of innovative functions including:

Simple integration of Retailers from their existing Web Sites into the Mall Site

Search facility across all retailers.

Aggregated shopping cart with single transactions and fulfilment.

Internet Shopping Mall Architecture

Figure 1 illustrates the Internet Shopping Mall site architecture of the preferred embodiment. Users will be able to access the Internet Shopping Mall shopping functions via a web browser 11 and the Internet 12. Pages will be served via a web server 13 connected to a Java based application server 14. The application server contains a common code library that control access to a JDBC (Java Database Connectivity standard) database. Also contained on the application server are the Customer Applications objects 16 that are built using the common services layer contained in the common code library. For payments and orders, the Customer Applications will communicate with the Transaction and Fulfilment Server (TFS) 18, this will be via XML messages 19. In turn the TFS will communicate 22 with a bank and payment gateway for merchant processing and order fulfilment 21.

The Internet Shopping Mall of the present invention is preferably implemented around two major components:

1) The Internet Shopping Mall System (ISMS) 17; and

2) The Transaction and Fulfilment Server (TFS) 18.

These two components interact to provide the full functionality required by an internet shopper. The Internet Shopping Mall System 17 provides the following databases:

Product / SKU database (catalogue and stock details)

Retailer database

Shopper database (including user profile information)
Content databases
The ISMS 17 will provide a means for the Customer Applications to access the database tables, and for committing and rolling back database transactions.
The ISMS 17 will manage user profile information.
The ISMS 17 will manage the association of user profile information with products in the database.
The TFS 18 will handle the transaction and fulfilment of orders.
The TFS 18 will manage partially fulfilled orders.
The TFS 18 will provide a HTTP/XML API for order management.
The TFS 18 will provide a HTTP/XML API for committing and rolling back transactions on the order database.

The Functional Structure of The Internet Shopping Mall site is illustrated in Figure 2 and the Integration Structure of the site is illustrated in Figure 3.

The shoppers 31 represent an important point of interface with the site 100. Their interaction with the site is limited to a single point, the web server 13, and their connection method will usually be HTTP (or HTTP + SSL), plus SMTP. Alternatives may include wireless protocols such as WAP Shoppers 31 will be able to transact on the site and use the advanced functionality with a basic web browser and without special plugins – however they will either need to have cookies enabled or the ISMS Application Server will need to embed a session identifier in the page URLs.

Retailers 32 are preferably integrated on three levels (refer to Figure 4):

1. **database:** stock control integration: connections with legacy stock control databases to maintain very up to date stock information on the Internet Shopping Mall site, and integration with Point of Sale databases for recording of purchase orders and managing fulfillment.
2. **pages:** management of page templates to define the display of product and supporting pages.
3. **functionality:** integration with advanced retailer functionality currently offered on a retailer's existing web site beyond that already offered on the Internet Shopping Mall site.

In addition, retailers 32 may want to use a Content Management System accessed via the XML gateway 121 to define promotions, manage

content on home pages (etc). In the preferred embodiment, stock control information can be integrated at five different levels. In order of sophistication (and broad preference), they are:

1. **linked:** The retailers or suppliers stock control database is read and updated directly via secure communications channels. No copy is kept on the Internet Shopping Mall side. Preferred method for large, high-volume retailers and service retailers.
2. **live:** A copy of the retailers products database is kept on Internet Shopping Mall. Updates are maintained in real time, with retailer and web site updates being synchronized between databases. Preferred for most retailers.
3. **batch:** Same technical setup as live, however changes are 'batched' and processed at timed intervals (e.g. every hour). Useful for smaller, low-volume retailers.
4. **manual:** Retailer does not have their own stock control database, or wants to keep stock control separate. All stock is maintained manually using the retailer management centre. Suitable for small, low-volume retailers with no existing or adequate POS system.
5. **offline:** Retailer sends periodic stock updates via e-mail, FTP or even on floppy disk. Internet Mall must upload the files and integrate into the database. Not suitable for most situations.

The above methods are important to two stages of retailer integration: *load* and *maintenance*. A retailer may use one method for load, and a second for maintenance. All five are suitable for load, depending on the setup of the retailer. However *offline* is not acceptable for maintenance.

Methods 1-4 involve communication between retailer legacy systems and the ISMS via the Web API gateway 121. Messages are formatted using an agreed set of XML standards. The XML objects are sent via HTTP. At the retailer legacy end, multiple data sources may be integrated, to build the complete set of product information on the ISMS. In the fourth method, the retailer management centre is a simple catalogue management program that utilises the same XML standards and effectively operates as a Web POS. In methods 1-3 a range of conversion utilities may be used to synchronise and update the databases.

HTML Pages

The Retailers 32 on the Internet Shopping Mall will generally fall into different classes of e-commerce readiness. It should be noted that a retailer's web sophistication is independent of their stock control database sophistication (for example, a retailer with no existing site may nevertheless have very good stock control databases.).

Depending on the retailers satisfaction with their existing e-commerce site, or whether or not they have an existing e-commerce site at all, a retailer may chose to design new pages for their ISMS presence, or have their existing pages automatically fetched by the ISMS for presentation to the shopper. Through a retailer management centre 33 retailers 32 use a *page loader* to either (1) load new HTML pages for the Internet Shopping Mall site; (2) nominate URLs where Internet Shopping Mall can load the required pages from their existing site; or (3) a mix of 1 and 2.

To serve a page to a shopper 31, the page server 110 can follow a number of possible paths, however, essentially the differences generally relate to the source of information rather that the process.

The page server pulls information from several sources to build a single page as follows:

1. Retailer template held in the Retailer's Mall Site template database 116, of retrieved from a template database 216 on the retailer's non-mall site 2000 or if it is a commonly requested page from the template cache 112;
2. The retailer's content held in the retailer's mall site stock database 111, which is updated from the retailer's non-mall stock database 211 on a regular basis;
3. The retailer's content held in the retailer's mall site content database 113, or in the retailer's non-mall site content database 213 if the content is heavily used and is being retrieved from the non-site database 213 it may be held in a cache 118;
4. The mall site "power-bar" template or other mall defined templates which are retrieved from the mall site template database 117; and
5. The mall provided content which is retrieved from the mall site content.

These components are assembled by the page server 111 to produce a composite page for serving to the shopper 31. Referring to Figure 5, an image of a retailer page as served to a user by the shopping mall site is illustrated by way of example. The page is divided into a retailer area 250 which occupies

most of the screen and a mall site area 150 which occupies the upper and right hand edges. The retailer area is defined by a retailer page template which includes locators to indicate insertion points for the page content. The page content may include a retailer's logo or banner 252, a number of other graphics or descriptive items 253 from the contents database 113 or 213 and stock information (such as price and availability) from the stock database 111. The shopping mall area 150 is merged with the retailer area by merging the respective templates. The mall area will include a variety of content including current news items 153 or, promotional items 153, navigational buttons 151 to allow the user to navigate around the mall and a house icon or banner 152 which are all obtained from the mall sites content database 114.

Many retailers 32 on the Internet Shopping Mall site 100 will not offer any functionality beyond that outlined below for the Internet Shopping Mall. However a small number of advanced retailers have specialised functionality.

While each retailers requirements need to be assessed on a case by case basis the integration strategy is generally managed in one of two ways:

1. **XML Object integration:** Internet Shopping Mall and the retailer agree on an XML standard to facilitate communication between the Internet Shopping Mall site 100 and the retailer site 200. When a web request on the Internet Shopping Mall site 100 requires advanced functionality from the retailer 32, an XML request object 102 is sent to the retailers non-Internet Shopping Mall web server 200 utilising an agreed Web API. Some coding changes are made to the page server 201 on the retailers site 200 that parses the XML and produces an XML response 103 (instead of the normal HTML one). The XML response 103 is parsed by the page server 110 on the web server 13 of Internet Shopping Mall site 100 and rendered in HTML 104 for the end user 31, possibly utilising XSL.
2. **Proxy write-through:** A request on the Internet Shopping Mall site for advanced retailer functionality is handed to the Internet Shopping Mall reverse proxy, which requests 105 the HTML page result 106 from the retailer, parses the HTML received, inserts Internet Shopping Mall functionality and then returns the resulting page 104 to the user 31.

The Internet Shopping Mall also has the ability to run its own promotions on site, perform content management tasks as well as perform basic systems administration. Integration with the banks or payment

gateways 301 is required to facilitate shopper transactions through payments from credit card accounts to merchants 32.

The web server receives the initial transaction request from the shopper in aggregate form. The web server passes the transaction to the Transaction and Fulfilment Server (TFS) which disaggregates the transaction, processes the component parts, and passes status information back to the web server for further processing (e.g. displaying receipt numbers, reporting failed transactions, etc). Communication occurs via XML objects.

The transaction module within the TFS is designed to be able to handle the numerous bank errors, service outages and roll-backs that will arise in a running system. The system can also handle multiple payment methods within the one aggregated transaction. This is achieved by the use of server-side e-wallets to hold multiple payment method information.

Process overview:

1. The shopper, after accumulating goods and services in their shopping cart and filling in their payment and delivery details, clicks Buy to complete the transaction.
2. The web server fetches the contents of the shopping basket from the session manager and formats an XML transaction request object. The object is passed to the TFS.
3. The TFS disaggregates the transaction. That is, it divides the transaction into merchants, calculates totals for each merchant, and loops through the merchants in a pre-defined order:
   a) for each merchant, pass a transaction request to the pseudo-gateway;
   b) the pseudo-gateway selects a transaction gateway 301 based on the preferred acquiring bank for that merchant. It is the pseudo-gateway that contains the routing table for each merchant;
   c) the pseudo-gateway is responsible for any immediate retries (e.g. due to connection timeout or broken link), possibly switching the transaction to a second (backup) acquiring bank 300 or gateway 301 if the first is not responding;
   d) the pseudo-gateway returns the response from the transaction gateway 301 using a common XML response object.
4. After receiving final responses from all gateways, the TFS aggregates them into a new XML response object, and passes it back to the web server. The web server may need to initiate new transactions (e.g. with

a different shopper credit card) but these are not distinguished from initial transactions and follow the same pattern.

The Internet Shopping Mall provides a central warehouse to facilitate most retailer fulfilment needs. In addition to the Internet Shopping Mall warehouse(s), some retailers will wish to fulfil orders out of existing facilities without holding stock at the Internet Shopping Mall warehouse. Cross-docking is therefore provided to facilitate aggregated delivery.

After payment processing and retailer notification the TFS:

- **for retailers aggregating fulfilment with Internet Shopping Mall:** notify the warehouse (fulfilment partner 400) to pick, pack and ship.
- **for retailers performing their own fulfilment:** notify retailer (i.e. acting as fulfilment partner 400) of goods to ship and delivery details;
- **for both:** track the shipment from purchase to Proof Of Delivery (POD) by accepting updates from fulfilment providers 400 and third parties.

The architecture is very similar to that of the payment gateway 301, consisting of a pseudo-gateway which will route to the warehouse or retailer as appropriate.

The fulfilment gateway 401 sends orders to the warehouse and allows fulfilment providers 400 and couriers to update the status of an order on its way to the shopper's delivery address(es). Aggregate orders are disaggregated and re-grouped by shipping address (since a single aggregate order can involve multiple delivery addresses). The gateway can feed information back through the retailer gateway to notify retailers of shipping status (e.g. return to retailer – no such address). The gateway also receives information back from the fulfilment providers to allow shoppers to query delivery status online.

Content Management System

A Content Management System (CMS) 101 is provided which incorporates a set of tools to allow retailers to:

1. manage page templates;
2. create and manage specialised content, such as promotions, reviews and voting;
3. create and manage retailer specific content. For example, a sports retailer may wish to maintain sports news or publish syndicated content.

General Content Management

'Content' describes anything intended to be displayed on a web page. It may be a mix of HTML and graphics. The content management system (CMS) 101 is not content-type specific.

Each object to be represented needs to be stored in the CMS, which may utilise the same database backend as the rest of the site. Each object would be indexed by object number so that they can be called from page templates. The object number should be unique but does not need to attach to particular content. For example, object 23 could be for the leading sports item of the day, rather than a particular story. In this way database updates are immediately reflected on web pages without the need for additional coding. Retailers can only access content they themselves have created and therefore access control is enforced by the CMS.

In some cases retailers will require very large or dynamic content (e.g. streaming media) to be displayed via the Internet Shopping Mall site. In such a case the CMS may only contain location information (e.g. a URL) to allow access to the streaming media without actually routing the datacast through the Internet Shopping Mall site itself.

Note that the same system will be used for retailers adding specialised content to pages as for Internet Shopping Mall to add its own content (for example, to maintain sports headlines in the sports precinct, or to allow a physical location to post news on its news page).

Promotions

In addition to the base functionality provided by the CMS 101, promotions would have a specialised interface to allow retailers to quickly and easily create and manage promotions. Retailers could define a promotion icon (mix of graphics and HTML), set the target demographic and other parameters, set the time range and start the promotion. The site would generate merchandising metrics specific to the promotion.

Promotions information is stored in the Content database, possibly in a separate 'promotions' table. This is because additional information (e.g. sales data) may need to be associated with a promotion.

Voting and Reviews

Content may also be generated by shoppers, who may post reviews relating to specific products, or respond to user surveys using voting forms. The creation, management and control of these two forms of content should

be run from the same CMS, using the same underlying infrastructure. Due to the specialised nature of the content however, the interface and database tables may be held separately.

Affiliates

The concept of an affiliate 600 on the Internet Shopping Mall site 100 is broader than the traditional Internet concept. In addition to including off-site (non-Internet Shopping Mall) web sites the Internet Shopping Mall affiliate program will track referrals from Internet Shopping Mall retailers 32 to each other. The affiliate program therefore consists of two technical parts: content and tracking.

The content may consist of

- banner ads: while reportedly ineffective as a traffic generation tool it is a low-cost standard format that could be supported by a large proportion of web sites;
- promotions: the promotions content as defined by Internet Shopping Mall and retailers may be exported directly to affiliate web sites;
- products: product data may be exported to affiliates (in a defined XML format);
- retailers: retailer data or retailer shop fronts may be displayed by affiliates (also likely to consist of XML objects).

The tracking component needs to record, for every product purchased, the referring page that led the consumer to that products 'product page'. There is no distinction between referrals that come from within the Internet Shopping Mall site and those that come from outside the Internet Shopping Mall site. Internet Shopping Mall can then use the referrals data to reward affiliates.

System Modules

The system comprises the following modules:

- **Shopper Web Interface:** Specifies components visible to shoppers or supporting infrastructure. Consists of entry points (home pages); precincts; shop fronts, merchandising services and transaction services.
- **Back End Services:** Specifies supporting infrastructure not otherwise covered above, usually because it does not have an interface directly visible to users.

- **Back Office Services:** Management supporting services for both Internet Shopping Mall and the retailers. For example: promotion management, content management, reports.
- **Internet Shopping Mall Interface:** Interface components and supporting infrastructure for the Internet Shopping Mall Management Centre (WMC).
- **Retailer Interface:** Interface components and supporting infrastructure for the retailers and their Retailer Management Centre (RMC).
- **Transaction Fulfilment Server:** Components supporting the transaction and fulfilment server.

Shopper Web Interface: Entry into the Shopper Web Interface is via a series of electronic 'doorways' into the site – enhancing the basic catchment to encompass affiliate and partner relationships. All pages except the Main Page require a single click access to 'home'.

Internet Shopping Mall Main Page: The main page provides a primary entry to the site, featuring the most significant retailers, providing single click access to the key features and promoting high value elements.

The following functionality is associated with the Main Page:

1. Single click access to all the major precincts.
2. Single click access to each of the key site services (merchandising services and transaction support services).
3. Shop logos for retailers on the main page, which will rotate through the various available retailers dynamically. Retailer icons may be chosen at random, with the distribution being skewed based on popularity or license fees. Where a user is a repeat visitor and profiling information is available, retailers may be selected based on that users profile.
4. Promotion space for some merchants, generated from the content management system (promotions subsystem).
5. Promotion space for Internet Shopping Mall and the site services.
6. The page may also include: voting spaces (to help build a user's profile, collect demographic information, etc); key news regarding Internet Shopping Mall physical centres; and a single large promotion space for a particular Internet Shopping Mall precinct (rotating through the various precincts at random).
7. Links to best-selling products and retailers.

Affiliate doorways: Affiliate doorways provide an entry point to the site from affiliate partners – collecting shop front icons and promotions of particular

relevance to the affiliate (eg: sporting shops and promotions for the Rugby World Cup site). Internet Shopping Mall content is presented on the affiliate site, which redirects the user to the Internet Shopping Mall site when clicked. In addition, Internet Shopping Mall retailers can chose to affiliate with other Internet Shopping Mall retailers, maximising any shopper nexus between retailers.

The requirements to provide Affiliate Doorways are:

1. The ability to export content from the Internet Shopping Mall site to the affiliate site through the affiliate engine. Content may consist of a mix of HTML, images and other objects. Content may be exported 'live' or in batch to affiliate sites.
2. The ability for the separate affiliate site to function as an independent element within an existing page.
3. Audit logs to be kept for all traffic referrals from affiliates. The Internet Shopping Mall site must track sales resulting from an affiliate referral and provide this information via the Internet Shopping Mall Management Centre.
4. Ability for WMC to create and define new affiliate partnerships and to authorise affiliates to display Internet Shopping Mall content.
5. Each product in a shopping cart to include information on the referring page or affiliate.

Precincts: Precincts are a core merchandising component of the site, collecting retailers into areas of common interest to consumers and segmenting retailers to allow them to retain a point of difference. Retailers may appear in multiple precincts where relevant (indeed, they may appear in a number of different locations within a single precinct). The top level precincts are:

- **Category:** Products and retailers grouped by category or subject matter. For example: fashion, health and beauty, food, home, gifts, SOHO, sports, toys, etc. The final cut of categories and sub-categories is not specified by this document and should be able to remain flexible so that Internet Shopping Mall can adapt the category precinct as it learns more about the online consumer and how they approach shopping on the site.
- **Event:** Products and retailers grouped by life stage event (e.g. birth, birthday, party, wedding, Christmas, etc). Again the precise configuration of the event precincts needs to remain flexible and under the control of

the Internet Shopping Mall web administrator so that the precinct can evolve to meet shopper needs.

- **Sale:** Collection of retailers and products currently on sale.
- **Centres:** Broken down by real-world mall. Each mall would contain the retailers who have a presence in that mall. Mall staff will also need to be able to add mall-specific content (e.g. current events at Miranda).
- **My Internet Shopping Mall:** A personalised precinct.

Core Precinct Requirements: Precincts share some common elements and structure. The following are goals and requirements that all precincts share.

Functionality required to support the various Precincts includes:

1. Single click access to all the other major precincts and to the Internet Shopping Mall Main Page.
2. Single click access to each of the key site services.
3. Shop fronts for most significant retailers in precinct (only in precinct sub-categories).
4. Promotion and logo spaces for merchants and for Internet Shopping Mall services. Where retailers are listed in specific precincts, or have specific promotions, the capability to link to that specific area within the retailers site (and not just to the retailers home page).
5. Voting spaces, including feedback from previous surveys. Once a user has voted, the page should display aggregate results collected so far.
6. Key content relating to the particular precinct, pulled from the CMS.
7. List of precincts best-selling products and retailers.
8. Retailers may be listed in all precincts where they are relevant – as configured in the precincts database under the control of Internet Shopping Mall.
9. Space for 'rotating' retailers, with the share of impressions based on popularity, user profile or fees paid.

- **Category**: Approximately ten to twelve major precincts organised around major categories of shopping lifestyle / category interest. For example: fashion, health and beauty, food, home, gifts, SOHO, sports, toys, etc. The makeup and breakdown of categories should be able to remain flexible so that Internet Shopping Mall can adapt the category precinct as needed.
- **Event:** Approximately 10-12 precincts organised around life stage events (e.g. birth, wedding). The makeup and breakdown of categories should be

able to remain flexible so that Internet Shopping Mall can adapt the category precinct as needed

- **Centres:** Thirty one precincts representing the real-world physical malls, grouped by state. Each real world precinct would contain retailers and news relating to it, as maintained by Internet Shopping Mall.
- **My Internet Shopping Mall (Customisation) :** A personalised precinct which collects shop fronts, promotions and content around particular interests of a registered shopper.

Requirements to support Personalized Precincts are:

1. Key content relating to the particular shopper profile
2. Live-linked list of best-sellers relevant to shopper profile.
3. Initial registration must consist of no more than 10 questions, and must provide registered shoppers with a password, using their e-mail address as their username.
4. Ability to create an e-wallet: the collection of credit card information (and when technology allows, debit card information) so that users need only enter credit card details once.
5. "What's New" service displaying a list of new features added since the users last visit (generated from the CMS).
6. The development of the user profile should be incremental. Coarse-grained profiling based on the very first product purchases or responses to survey questions at registration would be refined over time based on pages visited and products bought. Further refinements are possible through single question user surveys run from precinct pages.
7. Users should be able to customise colours, select their favourite retailers explicitly as well as manage account information (track orders, view purchase history, create and edit gift registries and manage e-mail list subscriptions).

Sale: Discount precincts collect discounted goods offered by retailers.

To support Personalized Precincts requires:

1. List of retailers currently running 'store wide' sales.
2. List of products currently on sale, organised by category.
3. List of best selling sale items and retailers.

Shops: The shops are the arrangements of all products, content and information relating to a particular retailer.

The functionality required to support Shops on the site are:

1. All shops should also have access to the common services in this section (e.g. gift registry) on a shop-wide scale.
2. All shop pages must contain the Internet Shopping Mall navigation bar, however the design of the rest of the page is entirely up to the retailer.
3. The minimum number of pages that may constitute a shop site is 5:
   - a main page (home page)
   - top-level category template
   - second-level category template
   - product template
   - an 'about us' page with contact information, return policy, etc.

The HTML pages define page structure – not content. The content needs to be built dynamically from database sources (either the products database or CMS). Support dynamic population of pages with content sourced from the CMS or products database.

Provide a sandbox environment, so that retailer shop templates cannot access data from other retailers in the run time system.

Shop Site Design

Core Elements

A Shop Site must have the following core design elements:

Shop icon:	The representation of the Shop Site both within the Mall Site and in any affiliate sites.
Shopfront:	The front page of the Shop Site.
Merchandise shells:	The pages that merchandise the types of products in the Shop Site.
Product shells:	The product templates that frame the Licensee's products.
About Us page:	The Licensee must provide a page which includes a short biography of the company, to engender trust in the customer's minds.

Merchandising Data

Images:	Images are generally included for all products capable of being photographed. The Retailer provides both full-size images and thumbnail (smaller and lower bandwidth) versions of the image.
	Full size images must be no more than 256 colours and 50K in size. Thumbnail images must be no more

than 16 colours and 5K in size.
All images must be titled with the SKU or unique identifier of the product, and the identifier of a thumbnail image must include an '_t' immediately preceding the dot extension (.gif)
E.g. for a product with the SKU 123456, the main image would be 123456.gif and the thumbnail 123456_t.gif.

Product text: Product text is provided by the retailer in either word, ASCII text, or Microsoft Excel format, with data either in consecutive columns of a table, tab delimited, or CSV form. The row structure is as outlined in Table 1 (Attached) with the product identifier matching the name of the corresponding images.

Draft Product Text Row Structure

Field	Description
Product ID / SKU:	Unique identifier for a product, possibly the product's SKU, PLU, or some variant, must be generated so that "neighbouring" products (e.g. same item in a different colour) can be easily located based on product ID alone.
Short Description:	A short description of the product, such as its name, being less than 255 characters (including spaces), for the purposes of identifying the product in lists and search results.
Long Description:	A longer description (less than 200 words) containing more information.
Small image:	Name of file, containing thumbnail image for product listings and search results.
Large image:	Name of file, containing larger, higher quality image.
List Price:	Recommended retail price or vendor's list price.

Sale Price:	Current sale price of the item. If unspecified, the default will be the list price. If there is a discount for multiple or bulk purchases, then this must also be listed.
Category:	A slash delimited path to the product specifying the categories and sub-categories. For example, the category may be "Jeans/Levis/501" or "Books/Non Fiction/Australian History".
Colour:	Available colour(s) of the product.
Size:	Available size(s) of the product.
Stock Level:	Current stock level for this item.
Alert Level:	Lowest stock level allowed before the Retailer is notified that stock of that item is low and the product needs to be re-ordered.
Intra-Shop Associations	Comma delimited list of the product IDs of the 5 most complementary other products within the merchant's product set.
Inter-Shop Associations	Comma delimited list of the 5 most complementary products beyond the merchant's product set.
Additional Fields	Additional fields may be specified, by sending a second file, listing additional field positions and their corresponding meaning. For example: ext. 1 Platform ext. 2 OS ext. 3 CPU

- The Internet Shopping Mall offers to retailers a service that utilises any investments they have already made in their web presence. The Internet Shopping Mall therefore reproduces only the HTML pages – leaving content and product data to be sourced from their databases via the retailer gateway and Internet Shopping Mall products database (which acts almost as a cache).

- The Mall of the present invention differs from previous attempts at mall design which shoe-horned retailers to fit into a particular template and page layout. The result was no branding or differentiating factors for retailers and a less than compelling experience for shoppers.

Search: The search facility provides rapid non-linear access to the site and allows shoppers to categorise the search by a variety of criteria.

Useability research shows that users often resort to a search engine when it is not immediately apparent where they should proceed from a given page. Despite users low expectations of search engines they remain a popular and often used navigation device. Given users low expectations, the Search Engine of the Internet Shopping Mall site is designed to exceed those expectations consistently and dramatically through the quality of the search results. This means using thesauri and phonetic matching as well as freeform style search queries and using the inherently structured nature of the data to maximise relevance. The aims of this function are to:

1. Provide accurate and relevant search results based on product-centric search criteria to maximise the ease with which shoppers can find the products and services that they are looking for.
2. Build a library of common search queries and the results most often selected.
3. The product search feature should never return 0 results.

The requirements to support the Search function are:

1. The search facility are be available from each page of the site in some form. The search should immediately execute by the user pressing the return key or a search button.
2. An advanced search ("power search") is available allowing segmentation by the following criteria – product, store, brand, price, category-specific criteria as well as keywords. Searches cover the entire site by default. A simple search uses the same underlying search engine, with neutral defaults selected for all criteria except keywords.
3. Search results should return with no more than 10 results in a given page. If a search results in 0 matches then the criteria are be loosened and the search repeated immediately so that the user always gets at least some results from any given search (the user is warned that there were no exact matches and that the next closest matches are being displayed instead). Users will never receive 0 matches for a search query.

4. Results are be ranked only by relevance to stated criteria.
5. Results return thumbnail graphics as well as the retailer's name/logo and short descriptions of products (as entered by the retailer).The search engine will use phonetic matching (e.g. metaphone algorithm) to catch phonetic spellings (or misspellings) and partial matches to catch 'off by one' misspellings. The search engine will also need a thesaurus available to it

Shop Together: The shop together service allows shoppers to 'join together' and shop online – each member shopper's click notifying all members of the group of the location of a particular member. Groups are likely to be limited to 2-3 people. This will increase both traffic and conversions by providing a shared experience for shoppers, which will increase shopper confidence in purchases and increase transaction volumes. This feature also provides community-style services to counter-act some of the perceived negatives of shopping on-line.

The system functions and operations supported by the "shopping together" feature are:

1. A 'shopping group' can be formed by a single registered shopper naming the group and entering a short description.
2. Subsequent shoppers must actively elect to join a 'shopping group' – but they do not need to become registered shoppers. The group founder can invite users to join the group via e-mail (with an included URL).
3. When a shopper joins a group, they are taken to the shop / service where the current group resides. Each member can browse independently however, moving about the site and communicating with other members utilising an in-browser chat window.
4. Any member of the group can request the group's attention by clicking a 'look at this' button – providing an optional hyperlink to the requestor's current page. This would appear in the chat window which, when clicked, would load the new page mentioned.
5. Registered shoppers can schedule new group shopping visits on their shopping calendar and send email notification to members of the group

The reasons supporting the inclusion of a "shop together" feature in the Internet shopping mall are:

- E-commerce sites do not always engender confidence in purchases, contributing to a high degree of abandoned shopping carts. Enabling

collaborative shopping would increase confidence in purchases and lessen the percentage of abandoned shopping carts.

- It is also clear from market research that most people shop with a partner or friend in the real world. The feature is novel and allows for a shared and fun experience (increasing traffic) and collaborative, informed purchases (increasing conversions).
- A large percentage of traffic originates in referrals from existing users. This feature provides both an avenue and trigger for referrals and an incentive for people to follow the referral and visit the site.

The points of integration for the shop together feature are:

- Shopper database.
- Shop together engine.
- E-mail engine.

Locate a Store: A service that allows shoppers to get the address and directions to the nearest outlet for a nominated retailer. This function provides accurate information (including map) on the location, and opening hours, of the nearest outlet of a given retailer, given a post code or suburb / state of the shopper.

1. Shoppers will preferably receive a map, with the exact location highlighted. Shoppers will also be able to zoom in, out, get street directory reference number and print the map. By entering a residential address (which will default to last delivery address if the shopper is registered and logged in), shoppers will also be able to get a list of driving directions.

Precinct builder: The precinct builder allows dynamic creation of precincts by populating a series of precinct templates with precinct content.

This function will facilitate rapid changing of precinct content (but not structure) by allowing dynamic building of precincts using a CMS and other database driven content. Repeat visits are encouraged by ever changing content on the main pages. The content is best managed by non-technical marketing staff who need a technical infrastructure to manage their content and promotions programs.

Allowing multiple segmentations of the market will help users to refine their view of the web site to something closer to their needs. This requires a large number of precincts which can be managed from a central mechanism to minimise maintenance and overheads.

The requirements to provide this function include:

2. A series of precinct templates - one for each type of precinct
3. Population of the precinct templates with shop icons, promotions and content relevant to the particular precinct
4. A *scalable* and open architecture, interfacing easily to content beyond the scope of the basic engine
5. Key navigational structures (navigation bars, site maps, text alternates) must be dynamically created as each precinct is built.

Integration points for the Precinct Builder include:

- retailer, product, promotion, and content databases:
- web developer page loader.
- Internet Shopping Mall management centre.

Shop Build Engine: The shop builder allows retailers to build and maintain best-practice internet shops at significantly reduced cost by dynamically populating marked templates with product content.

Shop Builder support a scalable architecture for the site that can manage 400 retailers, by moving common functionality into a base engine and allowing the full retailer site to be built out of no more than a handful of templates by populating pages dynamically with database content. Dual-site generation facility is also supported, so that the shop build engine can build a Internet Shopping Mall integrated shop site as well as a 'neutral' shop site that does refer to Internet Shopping Mall but uses the same technical infrastructure to generate the site. The above is achieved without resorting to primitive templating techniques that homogenise retailers or restrict their design freedom beyond the requirements of the shop site specification. An overriding consideration of the Shop Builders that Pages must be built and returned to users quickly.

The procedure for shop building is as follows:

1. Retailers to provide a series of shop templates as outlined in the Shop Site Specification. The shop builder is designed to produce a shop indistinguishable in quality from best-practice shops in each category – this means that the templates should not be restricted by arbitrary design guidelines or limitations imposed by architecture.
2. Shop pages are made rapidly accessible by shoppers – either by pre-compiling HTML output or by caching pages. Page caching may occur at the reverse proxy level.

3. The sites must be of a scaleable and open architecture, interfacing easily to components beyond the scope of the basic engine.
4. All functionality available to the broad site is also available to a specific retailer on a limited scale – including gift registries, product finders and search engines.
5. Navigational structures (navigation bars, site maps, text alternates) are dynamically created as the page is served, where necessary, to indicate context (e.g. greyed-out menu items).
6. Retailers need are able to populate pages with both product data and content managed through a single Content Management System (CMS).
7. Each function must be provided with a domain parameter – specifying site, mall, sub-site etc.
8. At the mall level, all Internet Shopping Mall services and retailers are visible from the shop site. In 'neutral mode', the shop builder generates a shop site without reference to Internet Shopping Mall. The Internet Shopping Mall functionality outlined in 0above is restricted to the retailer and only the products and services specific to the retailer are visible.

One of the several processes for page building is as follows:

- Web developers 500 (or the retailer themselves) use the *page loader* to upload their pages for each retailer 32, 200 into an account tied to the web developer 500. The pages are provided in HTML form with supporting web objects (e.g. images). The page is compiled – ie references to dynamically populated content are converted to an EJB call specifying the product SKU or content ID and the required field.
- The page loader moves the retailer pages into a retailer-protected staging area (ie only accessible to the retailer and the Internet Shopping Mall). The page loader notifies Internet Shopping Mall by e-mail that new pages are ready to be approved. Internet Shopping Mall approves the pages or rejects with comments. If approved, the pages are moved into live space.
- Pages define structure and layout – they do not define content. Content is defined through the CMS 101 and stock databases 111.
- The minimum five pages are
    1. Main page (home page)
    2. Top level category page template (e.g. menswear, womenswear, etc)
    3. Second level category page template (e.g. jeans, shirts, accessories, etc)
    4. Product page template

5. 'About us' page with contact details, return policy, store location and other retailer information.

- The retailer can add additional pages at their discretion, according to the Shop Site Specification.
- When a page is requested it is dynamically populated based on information in the URL and returned to the browser 31. Reverse proxies may be used to provide caching 112 of pre-compiled HTML.

The Page builder must integrate with the rest of the site via the following integration points:

- products, retailers, shopper, promotion, and content databases 15 (111, 113, 114).
- web developer page loader.

The "CORE" application 17 provides 3 fundamental capabilities to the Internet Shopping Mall Internet mall implementation:

1. A flexible, easy and intuitive process for retailers to design their shop sites and move the into the Internet Shopping Mall environment.
2. Provide a shop display engine responsible for displaying an integrated shop site by merging templates with database content to dynamically serve HTML pages.
3. Provide an interface to major components within the Internet Shopping Mall Internet mall application.

In providing these capabilities the "CORE" application 17 implements security measures to ensure unauthorised access to data or functionality whilst providing little or no restrictions on the web designers.

Shop Site Staging Area

The purpose of the Shop Site Staging Area (SSSA) is to provide a transition area for a retailer's web site design (HTML pages) to move to the Internet Shopping Mall Internet structure, format and architecture. It provides the retailer (or their web developer) a secure environment where they can:

- upload their web site;
- preview the uploaded web site (in HTML format);
- convert the web site to the Internet Shopping Mall format;
- preview their web site in the Internet Shopping Mall format.

- The SSSA also provides the environment for Internet Shopping Mall "mall" administrators to review and publish the web site to the live Internet Shopping Mall Internet mall.

Shop Site Construction

To provide a process to the retailer that applies minimal creative restriction in shop design while requiring no intervention from the retailer (or Internet Shopping Mall) to move the shop design into the Internet Shopping Mall Internet format necessitates a number of guidelines.

Although the SSSA could be used as a development platform it is envisaged that the retailer's web developer will prefer to prototype and develop the web site on their own development environment.

Site Directory

The Internet Shopping Mall shop implementation is based upon a retailer defining templates for differing categories of products and templates for products within a category.

A key issue is to allow the web developer 500 and retailer 32 the freedom to organise and develop their site with no or minimal restrictions whilst being able to move the site into the Internet Shopping Mall format with no or little re-work.

To facilitate this process the web developer is required to define and implement the site category hierarchy in a web directory structure (there is potential to do this at various levels). Within each category directory would be a template (or pointer to a template) that would define how that category is to be displayed or how the products for that category are to be displayed.

An example is a web developer developing a site for Paddy Palin that has level 1 categories of Tents, Clothes and Camping. Under Camping it had level 2 categories of Sleeping Bags, Tools, Cooking and Lights. Under Sleeping Bags it had level 3 categories of Mont, MacPac, Paddy Palin which were the companies that made sleeping bags. Under each of these brand names were listed their products.

The web developer 500 would create a web directory structure to mimic the category hierarchy:

eg. *web home*\paddypalin\camping\sleepingbags\mont. This directory structure will define the URL to each category and product ie. to list the sleeping bags at Paddy Palin the user will enter:

http://Internet Shopping Mall.com/paddypalin/camping/sleepingbags

In each of these directories held in the template database 116, would be the template (or pointer to the template) that defines how this category is to be displayed. In the case of the bottom most category then the template defines how the product is to be displayed.

The benefits of this approach are:

- the web designer and retailer can easily define the hierarchy and of the site;
- the retailer can define different templates for categories at the same "level";
- the web designer can demonstrate a site to the retailer as it will be viewed in the Internet Shopping Mall (in their own environment or Internet Shopping Mall's);
- "hard coded" pages and hyperlinks (eg. help and about us pages) will still be resolved when placed in the Internet Shopping Mall environment (assuming relative addressing is used);
- no re-work is required to convert the site into the Internet Shopping Mall environment (assuming all guidelines are adhered to).

A detraction of this approach is the effort to construct and maintain a directory structure for retailers that have a large category hierarchy

Templates and dynamic data

Template files define the layout and style for presenting category or product information. A template file is a HTML file within the shop site that contains a Dynamic Data Stub (DDS).

A DDS is a placeholder that signals to the Internet Shopping Mall environment that content external to this page is to be inserted at this location (eg. from the CMS database 113, 114 or product database 111).

DDSs are supplied to web designers in the form of GIFs with guidelines on the syntax to be provided within the HTML to allow the Internet Shopping Mall environment to associate the GIF placeholder with the target data source.

The collection of DDS placeholders will be enhanced as web designers/retailers require differing interaction and presentation for their customers. Through plug-ins to popular web design environments (eg. Dreamweaver™), a DDS toolbox will allow the designer to quickly select and place the appropriate DDS placeholder prompting the designer for the DDS

data source (if appropriate) and presentation requirements (eg. style, layout, colour etc.)

It is anticipated that the majority of templates will be a collection of HTML tables consisting of any number of DDS GIFs.

File formats

Templates are to be provided as text files in HTML format (ie. not in ASP, JSP or some other format that serves HTML).

Static HTML pages are to be provided as text files in HTML format.

Content may include any of the commonly used media rich formats (eg. GIF, JPEG, AVI, QT, QTVR etc.).

Site upload

Once the retailer is satisfied with the layout and content of their site it is uploaded to the Internet Shopping Mall SSSA.

This action requires the entire site to be uploaded from the web developer's environment to the SSSA maintaining the directory structure and including the template files, static files and required images.

Once the site has been uploaded to the SSSA the web developer and retailer will have the capability to review the uploaded "HTML" site in the Internet Shopping Mall environment.

Site conversion

Once a site is in the SSSA the retailer is in a position to convert their site into the Internet Shopping Mall format. Conversion will be performed by the SSSA Site Converter (via the SSSA menu bar).

Clicking the Site Conversion on the SA menu bar will prompt the user for the base URL and prompt the user to re-authenticate. The SA will then walk the shop site tree to:

- validate the template structures and syntax;
- convert the DDS GIFs to servlets/droplets;
- create XSL script files where required to define the presentation of the data returned for the relevant DDS placeholder;
- convert the template HTML pages to Dynamo™ *.jhtml pages;
- resolve hyperlinks in the templates and static HTML pages;
- validate the category URLs against the product database;
- store the category URL/template pairs in the template lookup table;
- e-mail the retailer and Internet Shopping Mall that the site has been converted;

- log the conversion details.

The retailer along with Internet Shopping Mall can now review the site under the Internet Shopping Mall architecture as if running in the live environment.

Directory conversion

Once a site has been translated to the Internet Shopping Mall environment the retailer can modify, upload and translate individual directories (categories) templates in the SSSA (via the SSSA menu bar). If required the template lookup table will be updated.

Page conversion

Once a site has been translated to the Internet Shopping Mall environment the retailer can modify, upload and translate static pages in the SSSA (via the SSSA menu bar).

Site approval

When the retailer is satisfied with their site they will submit a request for Internet Shopping Mall to publish their site in the live mall. On internal approval to publish (copy) the site then the Internet Shopping Mall staff release the site in the live Internet Shopping Mall environment.

In essence, this act will copy the appropriate static HTML files and supporting images, and template lookup information from the SA pre-approval area to the live mall environment.

A "live" timestamp will be recorded for all site, category and static page activations.

Conversion reports

After each conversion (site, directory or page) the SSSA will display a conversion report detailing:

- each catalogue and page converted;
- details of DDS translations including the XSL file name and location (if created);
- any errors encountered.

Audit trails

The SSSA will provide auditing on the following events:

- access to the SA;
- upload of site/files to the SA;
- compilation of sites/files in the SA;
- disabling a site;

- deletion of a file or site.

Shop site view

The SSSA will allow the retailer to define the mode of presentation for their site. They will be able to select either Neutral mode or Internet Shopping Mall mode. In Neutral mode the SSSA will serve pages based on the "neutral" template supplied by the retailer. In Internet Shopping Mall mode the SSSA will serve the shop pages based on the "Internet Shopping Mall" template supplied by the retailer. In this mode the retailer has the option to view the ages with or without the Internet Shopping Mall navigation bar.

Content Management: The Content Management System (CMS) 101 is a service for both retailers and the Internet Shopping Mall to create and define content which is then dynamically 'plugged' into HTML pages prior to being sent to users. The CMS allows non-technical staff opereating a client terminal 120 to quickly and easily create content for display in various parts of the retailer sites or Internet Shopping Mall precincts. The CMS is used to facilitate a dynamic and ever-changing content matrix to entice shoppers and encourage both purchases and repeat visits. It provides a single point of control to manage security issues relating to the introduction of content on the Internet Shopping Mall site.

The functions required to support the CMS are:

1. Authentication of retailer or Internet Shopping Mall staff member.
2. Create content either in HTML form, or allow the uploading of richer content objects (Flash files, images, sounds, QuickTime movies, etc).
3. Allow content to be time limited (e.g. only display from 1-Jan-00 to 2-Jan-00).
4. Allow content to be targeted to particular user profiles or triggered by events (e.g. viewing a particular product).

Just as retailer pages are populated with content from the products database 111 so too can they be populated with additional content from a content database 113, 114. The web developer may specify for example "top headline goes here" and the page builder will fetch the content from the content database 113, 114and populate the HTML page with it. *Note* that the content can be from the retailer's private content database 113 or the mall operator's universal database 114. The mall operator may also have a content database for exclusive use in mall generated areas of the site.

All content is time limited. The start time may be 'immediately' and the end time may be 'never' or otherwise dates may be chosen. New content can be loaded automatically into the database, and pages do not need to be reloaded since they contain only hooks and HTML structure.

It is also important that content removal be controlled in such a way that does not cause broken images or missing content on pages where that content is still required.

The main points of integration of the CMS 101 with the system are via content, and shopper databases, and page builder.

Internet Shopping Mall Interface

Internet Shopping Mall Management Centre: The Internet Shopping Mall management centre allows Internet Shopping Mall to manage the centre and view key metrics. This function facilitates technical and non-technical Internet Shopping Mall staff managing all aspects of the Internet Shopping Mall site: content and promotions; preview and approval of shops and precincts; performance and merchandising metrics and billing. It also provides a single point of interface for centre management to facilitate security and auditing.

Most aspects of the operating of the Internet Shopping Mall site will be managed by business managers with no technical background. To best perform this role the WMC is organised around business functions, rather than reflect the underlying technology or architecture.

A major security threat comes from authorised staff members making unauthorised changes, or unauthorised staff members gaining any access at all. Most security compromises come from internal threats – therefore strong authentication, auditing and accountability is required to minimise risk.

1. The functions provided by the Internet Shopping Mall Management Centre interface are: Ability to preview and rebuild online shops and precincts.
2. Performance metrics for site, categories and shops and ability to generate reports.
3. Stock management tools to alter stock if needed.
4. Real-time monitoring of site traffic and sales by segment.
5. Promotions and direct marketing tools to manage campaigns.
6. Content management tools to manage other content requirements.
7. Order status information for all site orders.

8. Data mining centre to examine shopper, transaction and product information throughout the site and by category.
9. Billing information for the site.

The Internet Shopping Mall Management Centre interface allows centre staff to log on from their browser to the ISMMC. They will only be authorised to create content or promotions for their particular precinct. They may create or upload content, set business rules governing the display of the content, then activate the display of content. They may then track impressions and click-throughs to measure the success of the initiative.

Head office staff may log on from their browser to the ISMMC to get retailer sales figures for the purposes of billing. If sales have dropped or risen sharply they may wish to examine recent retailer promotions to learn from the success or failure of the program to build a knowledge base of what constitutes a successful on-line campaign.

Head office staff may create Internet Shopping Mall promotions to be run on-site or through affiliate partnerships. They will need to create new affiliate programs, publish content through those programs, and then track the success (or otherwise) of the affiliate.

Technical staff will need performance figures and trends for the purposes of capacity planning and predicting spikes in network load.

This interface is required to integrate with all databases, components and functions of the internet shopping mall.

Affiliate Management: The Internet Shopping Mall system incorporates a tool to create and manage affiliate partnerships: creating new affiliate programs, authorising affiliates to download selected content, and then tracking sales resulting from affiliate referrals.

The features of the Affiliate Management module are:

1. Secure logon so that only authorised Internet Shopping Mall staff can create a new affiliate program.
2. Content may be exported from the Internet Shopping Mall site to the affiliate site through the affiliate engine. Content may consist of a mix of HTML, images and other objects. Content may be exported 'live' or in batch to affiliate sites.
3. Audit logs are kept for all traffic referrals from affiliates. The Internet Shopping Mall site must track sales resulting from an affiliate referral and

provide this information via the Internet Shopping Mall Management Centre.

Briefly the operation of the Affiliate program is as follows:

- Internet Shopping Mall staff will create affiliate accounts, with an affiliate ID used to track transactions resulting from referrals.
- After a user clicks on affiliate content and visits the Internet Shopping Mall site their session contains the affiliate ID. If the user proceeds to checkout and makes a purchase then the affiliate ID is credited with the purchase.

The main points of integration for the Affiliate Program with the Internet Shopping Mall are:

- shopper, and transaction **databases**
- Affiliate tracking software.
- Affiliate content export engine.

Retailer Interface: The retailer interface consists of two parts: stock database integration (Inventory and Product Database) and the Retailer Management Centre (RMC).

Inventory and Product Database: This module provides integration of retailers existing stock and inventory control databases, or point of sales (POS) systems, to provide real-time or batch updates of Internet Shopping Mall's products database.

E-commerce sites must present users with up to date stock information, including stock availability and expected shipping times if they are to add sufficient value to users to be worth using. This information must come from the retailer and must be updated as frequently as the data requires.

A major concern for a retailers operating on the Internet Shopping Mall site is cost, and a major goal of the project is to substantially reduce the cost of retailers wishing to operate online. Integration with existing systems allows retailers to leverage off existing investments in IT infrastructure and expertise and also ensures high quality data reaches the Internet Shopping Mall site.

The Inventory and Product Database enables accurate collection of retailers products data (including stock levels) for use on the Internet Shopping Mall site to facilitate high-quality, accurate and up to date stock information for consumers. This function adds value to retailers by

integrating with their POS, minimising the retailers overhead in conducting e-commerce and reducing their costs.

The Inventory and Product Database provides the following functions:

1. Facilitate an integration at one of the following levels: linked, live or batch.
2. Accommodate full range of available retailer information, minimising the amount of 'normalisation' that must occur to accommodate the retailers legacy systems.
3. Stock information must be updated either when (1) the retailer makes a sale and takes the stock from the same area that online sales are filled from; or (2) a sale occurs on the Internet Shopping Mall site.
4. Internet Shopping Mall stock records may be updated from multiple sources: e.g. retailer POS system, inventory control system, agency system.

Integration between the Retailer system and the Internet Shopping Mall occurs as follows:

- Retailer legacy databases are interfaced via 'plugs' which convert from the retailer system to a standard XML data stream. Updates are sent via the net to the Internet Shopping Mall site where the XML stream is loaded into the RDBMS.
- System to allow retailers the ability to amend stock information in the database. Writes can be directed back via the MSMQ + plugs system to legacy POS systems (or not). Alternatively, the system can take the place of a POS (may be useful to small retailers with no existing POS).

Points for integration of the Inventory and Product Database with the rest of the Internet Shopping Mall System are:

- products, and retailers **databases**
- XML product receiver.
- External: retailers, agencies, etc.
- Retailer Management Centre

Stock Management: The stock management service allows retailers to update and manage their stock levels in their Internet Shopping Mall internet shops.

E-commerce sites must present users with up to date stock information, including stock availability and expected shipping times if they are to add sufficient value to users to be worth using. This information must

come from the retailer and must be updated as frequently as the data requires.

By allowing integration with existing systems the stock management service again allows retailers to leverage off existing investments in IT infrastructure and expertise and also ensures high quality data reaches the Internet Shopping Mall site.

The stock management service provides a facility for retailers to create, edit and delete SKUs and fill-in gaps in their product profiles and information. Information includes stock levels, with notification of when stock falls below the alert level.

The stock management service also provides a stock and inventory management system for those retailers lacking a sufficiently sophisticated POS system.

The stock management service provides the following functions to the retailer:

1. Ability to add / remove and edit product content.
2. Access to stock level history over recent period.
3. Email-based notification of low-stock levels.
4. Ability to define profiles for products matching shopper and event profiles.
5. The typical operation of the stock management service is as follows:
6. Retailers log on to the RMC and access the Stock Management screen. The screen lists all categories and SKUs and allows retailers to create, edit or delete SKUs.
7. Retailers can view stock whose stock level has fallen below the alert level, sort stock by sales volume or other criteria.
8. Retailers can upload new content, such as product images, or edit any part of the stock information.

Integration with the rest of the Internet Shopping Centre is through the following integration points:

- products, and retailer databases
- RMC.
- Stock & Inventory gateway.

Page loader: This is a facility for retailers to upload new page templates for the management of the Internet Shopping Mall to review, prior to making the new page active on the live site.

This provides a central monitoring point to ensure that the management of the Internet Shopping Mall retains control over the final quality of shop sites and conformance to the shop site specification.

The Page Loader also provide technical infrastructure for retailers and their web designers to upload and review new page designs.

The system requirements for the Page Loader function are:

- Secure logon for web designers, who can access page upload areas for only those retailers that they work for.
- Page compiler converts references to data to EJB calls and coverts the HTML page to a JSP.
- Notification facility so that retailers and Internet Shopping Mall can be informed when there is a page for review.
- The Page Loader, when in use requires the following actions:
- The web developer logs on to their account and uploads the retailer pages into retailer specific directories (named by the retailer ID). Once loaded the page loader performs some preliminary checks (compiles the page, checks size and HTML compliance) and notifies Internet Shopping Mall of the new page.
- When uploaded the page contains 'stubs' to act as placeholders where information should go. For example "this is the short description" or "large image goes here". This can be done by using standard text or tags to denote content types. The page compiler converts these tags to EJB calls with the appropriate fields filled in.
- Internet Shopping Mall management can approve or reject the page with comments. If approved the page is moved into live space. If rejected the web developer is e-mailed with the reasons for rejection and required action.

The points of integration of the Page Loader with the Internet Shopping Mall are:

- e-mail engine.

Metrics

DATABASES

The core databases of the development will be described below. These information stores cover key retailer, shopper and transaction-based information. (NB: These are logical information stores – and may in reality comprise a number of databases)

Shopper Database: Shopper information assists the site in maximising convenience and tailoring content and product to shopper needs
Requirements:
Retailer Database
Description: Retailer information contains the non-product information needed to build the retailer's site
Product Database
Description: All key information about all listed products
Transaction Database: The transaction information store contains a record of all the transactions processed by the system
Content Database: Additional content and entertainment for the site – both formal and informal
Promotion Table: Information store containing details of all promotional campaigns conducted by the merchants

Aggregated checkout

Aggregated checkout is a novel component of the internet shopping mall in so far as it synthesizes the buying process to a far greater degree than possible previously. In a preferred embodiment o ft he shopping mall, as shoppers move about the site and add products to their shopping cart, these products are added to a single unified Internet Shopping Mall cart, sorted by retailer. All buy buttons in all shops will therefore be pointed to this global or aggregate cart. Once a decision to purchase has been made, the checkout works through a multi-stage requirements-gathering process, sub-dividing the checkout process into a number of logical steps to determine shipping destination(s), gift services (wrapping and cards), payment methods and aggregation level. Once these requirements are determined, the system creates a summary for user confirmation and then passes the transaction to a dedicated Transaction Fulfilment Server (TFS) for managing the payment, pick pack and ship phases.

Shopping Cart

A Shopping Cart is a non-persistent collection of items including price, quantity, and description waiting to be made into an order.

The shopping cart allows shoppers to add merchandise from a number of merchants to the cart, aggregates merchandise under each merchant and allows the shopper to alter and purchase goods from the cart.

In the Internet Shopping Mall of the present invention a preferred shopping cart will have the following characteristics:

The User will have no more than one shopping cart.

All Users (registered, unregistered, logged in, not logged in, partial log in) may have a shopping cart.

The System will clear the shopping cart when the session times out.

The User will view the contents of a shopping cart at any time, even if the cart is empty.

Shopping cart will only hold uniquely identifiable products (i.e. SKUs).

The System will validate the SKU number of each item in the shopping cart and remove any items from the list with invalid SKU numbers. The System will display an error message to the User when an invalid SKU number is detected.

For each item in the cart, the System will check the availability of the item in the product database and display the appropriate status each time the User refreshes shopping cart page or clicks the "Update" button.

A User may move an item (which may have quantity greater than 0) out of the shopping cart and into the wish list.

A User may link to a product details page by clicking on the short description of each item.

A User may link to a retailer's home page by clicking on the retailer's icon.

A User may click the "Remove" button associated with each item to remove the item from the cart (regardless of quantity)

A User may enter the following: 0, <space>, tab in the quantity field associated with an item and hit the shopping cart "update" button to remove the item from the cart.

A User may enter a non-negative integer and select the "Update" button to adjust the quantity of the item in the cart.

The System will ignore any non-numeric characters or negative numbers (excluding <space> and <tab>) entered in the quantity field of each item. The System will display the original quantity if the User updates with these characters in the quantity field.

The User may click "Proceed to Checkout" to start the checkout process if there are 1 or more items in their shopping cart.

If the User selects "Proceed to Checkout" from a shopping cart with 0 items, the System will respond with an error message and display the shopping cart page.

The User may click on "Add to Cart" from any page to add a uniquely identifiable product to the shopping cart.

If a User adds an item to their shopping cart that is already in their cart, the System will ignore the action.

If the User has added to their cart an item from a Gift Registry, the System will change that item's status in the Gift Registry to "Reserved".

Shopping Cart User Interface

The System will display a product list with the following details:

Short Description – linked to product page
Quantity (editable)
Price (with tax) – unit price
Availability (in stock, out of stock)
Retailer
Total Price
Subtotal by retailer
Remove button
Move to Wish List button

The System will display the following buttons on the view cart page

Update cart
Proceed to checkout
Continue Shopping

The System will group items in the shopping cart display by retailer alphabetically followed by short description. The stock level for items in the shopping cart will be indicated as follows:

If the availability status of an item is "in stock", the System will display "in stock".

If the availability status of an item is "out of stock", the System will display "out of stock".

If the availability of an item in the shopping cart is below or equal to the alert level, the System will display "out of stock".

Additional features of the shopping cart are:

- The maximum quantity of a single item in the shopping cart is 99.

- The "Buy Now/Quick Buy" feature is not accessible from the shopping cart page.
- The cart contains all purchased items grouped by retailer. Shoppers may expand and collapse list for each retailer to outline individual purchases within a retailer or hide detail.
- The cart contents are visible in summary form on each page of the site (for example, under the "My Bag" button the text "3 items" might appear, together with a cumulative total).
- Removal and modification of entries in the cart are easily achievable.
- Transfer of items to a wish list or registry is easily achievable.
- The cart is linked to a registered shoppers registry and wish list to allow things to be moved into and out of those areas.

Check Out

Check Out is a process that allows a logged in User to purchase and have delivered the items in their shopping cart.

The characteristics of the Checkout process are:

Only a logged in or partially logged in User may proceed to Check Out to create an order.

The System will display all delivery addresses that the User has previously specified

The User may edit existing delivery addresses and add new delivery addresses

The System will allow the User to assign one delivery address to each item in their order. A tool is provided to allow a user to split transactions across multiple delivery addresses and recipients.

The User may assign gift wrapping and cards to each item in their order.

The System will group items into consignments determined by delivery address and warehouse.

The System will allow the User to specify a shipping option per consignment.

The System will allow the User to specify their credit card details for the order and use multiple payment methods.

The System will allow the User to navigate through the Check Out process to alter their order preferences.

If the User has bought an item from a Gift Registry, the System will change that item's status in the Gift Registry to "Bought", when the order is committed.

The System will notify the TFS of the new order , allowing the shopper to manage all aspects of delivery and payment.

Phased payment system are provided, allowing deferred transfer of funds if the shopper orders goods that are not currently in stock and must be back-ordered.

Checkout User Interface

The System will display the consignments grouped by delivery address and the items within the consignments grouped by retailer.

Before confirmation of the order, the System will display a summary of the order, grouping consignments by delivery address with an address subtotal, and listing the following details per consignment:

Delivery address
Item descriptions - listed by retailer
Aggregate item cost
Delivery cost
Wrapping and card cost
Consignment cost

When the order is confirmed the System will display the returned order number from the TFS.

The transaction support services assist shoppers in making transactions – improving convenience and quality of service

The checkout facility performs the following functions:

The currently available delivery and payment information (either from cookies or registration) is assembled and prompts are provided for remaining information and confirmation to proceed.

Delivery and tax totals are calculated, and summary lists are provided, segmented by retailer.

The transaction is passed as a single aggregated transaction to the TFS, which processes payments for each retailer sequentially by looking up retailer payment information and passing information to the gateway.

The TFS gathers all result codes and returns them to the checkout page. The checkout page may need to notify the user that payment has been

deferred (e.g. if a gateway is temporarily down), credit card refused or that some other problem has occurred.

A confirmation page is provided to the shopper with a unique order number for tracking purposes. Order information is then stored in the transaction database.

The Checkout page allows users to specify multiple payment methods (eg by using two credit cards, each with differing amounts; or using a gift voucher, with the balance being covered by credit card).

Shoppers are able to split the order, sending items to different delivery addresses where required.

Shoppers are able to specify gift wrapping options within those retailers offering gift wrapping.

Checkout Process

- The Checkout first asks users for their e-mail address. For unregistered users, this is a registration process (that only creates the account). For registered users, this constitutes a user logon.
- Users next specify a shipping address. This should already be filled in for repeat customers. Users can specify multiple shipping addresses if they intend to split their order.
- Users specify which delivery address to send each product to, set gift wrapping options, and can set final quantities for goods in the cart. Users can create 'New Address' to create multiple shipping addresses.
- Next, users specify delivery options (which level of service to use).
- Users then specify payment methods, entering a combination of credit card, gift certificate number or loyalty points number.
- Finally users are given a confirmation screen with all details of their order and a receipt number. Clicking 'purchase' completes the transaction.

Order Tracking

Order tracking allows shoppers to follow the progress of their packages online at each point during their progression. The order tracking system provides accurate and current information on the status of a user's order, in so far as the fulfillment partners can provide. This will assist in engendering confidence in the buying process and should increase the number of repeat transactions.

Order Tracking Functions

Access to order tracking information is restricted, requiring the user to log on to their account with their password.

Basic details are provides for each order. The key transaction stages are: payment pending; payment received; goods shipped, goods in transit; awaiting pickup or goods delivered. Must also support finer grained information if the fulfillment provider is able to support it.

Auto-generated e-mail updates are provides through the four key stages if the user requested such notification at checkout (default is "yes").

Email-based and telephone access is provides to retailer and / or fulfillment partner for further queries.

Order Tracking Process

At checkout a user receives an order number on the web page which is also e-mailed to them. The e-mail includes a URL which brings up the status of that particular order. The order number is also available to the shopper once they have logged in to the 'My Internet Shopping Mall' page.

As goods proceed through the delivery chain status updates are sent to the fulfillment gateway, which updates the transaction database with the new status information.

- The status information is then dynamically made available to the user through their My Internet Shopping Mall page. In addition, e-mail is sent overnight if there is a change in the delivery status for an order.

Aggregated Merchandising

Merchandising Services

Merchandising services assist merchants in selling their goods and services by providing shared services across merchants and allowing retailers to expose their products beyond the confines of their particular shops.

Personal Shopper & Gift Finder

The personal shopper and gift finder use contextual information and questions to actively assist browsing shoppers to find goods and services matching their needs. They are essentially the same service – the personal shopper is a gift finder targeted for the user (the gift finder allows the user to specify their own target).

Goals & Priorities:

1. To provide useful and relevant gift suggestions for shoppers looking for a gift for a particular person, thus increasing conversion rates and sales.

2. To collect information allowing the products database to evolve product profiles for each item in the database (eg this item is popular with fashionable but price sensitive males who have just moved out of home). This information can then be fed back into the process to further refine the quality of gift suggestions.

Supporting requirements

1. Use contextual information available from the session data (eg location, registered shopper information) to minimise requirements-gathering time and feed as much available information as possible to the gift finder engine.
2. Should ask a series of no more than 8 focused questions concerning the recipient and event in order to fill in any gaps in the giver and recipient profile in order to determine recommendations.
3. Should tell the shopper how many matches occur and offer recommendation page containing a list of 10 recommendations, and also offer the option of retrieving 10 backup recommendations if the shopper desires. If the shopper must resort to backup recommendations, they should be able to indicate their dissatisfaction, and provide further information to help refine the suggestions further.
4. The recommendation pages should allow immediate purchase of items; placing the items in the shopping cart; or going to the product page to get more information.
5. If the gift finder's recommendations result in a buy, the gift finder engine should use the information to evolve the likely target market for that retailer and product.
6. Should list popular purchases on the questions page for immediate acquisition.

At registration, shoppers identify with a particular user profile. The profile defines values across a number of characteristics:

- price sensitivity;
- fashionability;
- life stage; and
- time sensitivity.

These settings are initially coarsely defined but would be fine tuned by the shopper or the system over time. As registered shoppers purchase products the products align themselves with the characteristics of the

shopper (eg if a particular item is repeatedly bought by fashion conscious shoppers then it is likely to be characterized as fashionable). Retailers can broadly characterize their products however fine tuning is performed entirely by the system.

The system is bi-directional and therefore the purchases that a shopper makes may influence their profile (eg a 'Retailer A' shopper is less likely to be fashion conscious and more likely to be price sensitive or time sensitive).

Retailers may also nominate a small number of products as being suitable for particular events (eg wedding, birthday, mothers day, etc).

The modeling engine matches profiles, between shoppers and products and events and products. The top ten matches are returned to the shopper.

The personal shopper is a rebadged version of the Gift Finder, without event profiles. The shopper profile is not explicitly asked for because the shopper has already defined one at registration.

Personal Shopper and Gift Finder

The personal shopper and gift finder features allow a User to request product recommendations from the System based on the core profiling service. The User may search for a gift by one of two methods:

1. Natural Language Search
2. Profile Criteria Search

The System will parse the natural language query to extract keywords which are associated with the profile criteria.

The profile criteria are:

3. Age
4. Relationship
5. Occasion
6. Price
7. Interests

The System must always return at least one item.

The personal shopper differs from the gift finder only by setting default values for the search criteria from a shopper's profile. The System will display the following details for each item in the search results page:

8. Short Description – linked to product details page
9. Small Image – linked to product details page
10. Retailer – linked to retailer home page
11. Ships Within ("24 hrs" or "5 days")

12. Price (if item is SKU) or Price Range (if item is a product with multiple SKUs of varying price)
13. Category
14. Subcategory
15. Retailer Category
16. Other Stockists

Each product in the product database must be resolvable to a category, subcategory, retailer category, and "other stockists" with an associated URL. Each product in the product database will have non-null values for each of the following:

- Age
- Price Sensitivity
- Fashion-ability
- Occasion
- Sex
- Relationship
- Interests

Each registered User in the User database will have a profile containing non-null values for the following:

- Age
- Sex
- Fashion-ability
- Price Sensitivity
- Time Sensitivity

Gift Registry

The gift registry allows Users to create and maintain a list of items they desire, associate this list with an event (e.g. wedding), and distribute this list electronically. The Gift Registry allows gift-givers to view the list of items, purchase these gifts online and have them delivered to the recipient. The gift registry may also be used as a wish list.

The Gift Registry shall be designed to support the feature set of a Wish List

Only a logged in User may save a Gift Registry.

A User may have more than one Gift Registry, identified by registry name.

The Owner may associate an event and two names with a Gift Registry

The Owner may create and edit a list of recipient names and email addresses which the System will notify via email of the registry's existence.

The Owner may select to send to all recipients notification of the Gift Registry and a link the gift list.

The System will assign an event code to each of the Owner's Gift Registries

The Owner may specify security preferences for their Gift Registry.

The System will allow the Owner to add items to a specified Gift Registry from any product list or product details page on the site.

The Owner may remove an item from the Gift Registry

The Owner may edit the quantity of an item in the Gift Registry

A User may find another User's Gift Registry by entering an event code or by entering a minimum of one surname and the type of event.

The User may buy either for themselves or for the Gift Registry from the Product Details page

The System will maintain the status of each item in the gift list. When a User adds an item to their cart, from the Gift Registry page, the System will change the status of the item in the Gift Register to "Reserved". When a User buys an item from the Gift Registry, the System will increment the "Bought" quantity of the item until the quantity "Bought" equals the quantity specified by the Owner.

If the Owner has specified a delivery address, the System will associate that address with an item added to the User's cart. The System will display this as the default address of that item when it is in the Check Out Process.

The System will display to the Owner their gift list with the following details per item:

1) Short Description – linked to product page
2) Small Image – linked to product page
3) An editable quantity
4) Price (with tax) – unit price
5) Retailer
6) Bought status (yes, quantity remaining, no)
7) Remove button
8) Update page button

The System will display to the User a gift list with the following details per item:

1) Short Description – linked to Gift Registry product page
2) Small Image – linked to product page
3) Quantity
4) Price (with tax) – unit price
5) Retailer
6) Bought status (yes, quantity remaining, no)
7) "Add to Cart" button
8) "Buy Now" button if and only if the User has a registered address or the Owner has specified a delivery address for the Gift Registry.

When a User clicks on a link to a product page, from the Gift Registry, the System will display the selected product details page with the following extra features:

1) "Add Gift to Cart" button
2) "Buy Gift Now" button if and only if the User has a registered address or the Owner has specified a delivery address for the Gift Registry.

The User may only buy for the Gift Registry from the gift list on the Gift Registry page.

Locate a Store

This feature allows Users to search for the location of the nearest retailer outlet to a given post code or suburb.

The User will enter either a post code or a suburb and state

The System will search for the closest Retailer outlet

If the search produces an exact match, the System will return the location of that outlet. Otherwise, the System will return the nearest matches.

The User may search for a Retailer outlet from a Retailer page

The User may search for a physical centre associated with the Internet Shopping Mall from a Internet Shopping Mall page

The System does not differentiate between retailer outlets in Internet Shopping Mall centres and non-Internet Shopping Mall retailer outlets except through display results (eg Internet Shopping Mall centres may be marked with a special logo. This information is kept in the database)..

Gift Reminder

This feature allows Users to associate events, people, and gifts with dates on a calendar. The System sends the User gift reminders via email prior to the event.

A System allows Users to add an event to the calendar in their Gift Reminder.

The User may add all standard events to the calendar in their Gift Reminder.

The User may associate persons to events in their calendar. These persons may or may not have a User profile.

The User may edit the profile of a person in their Gift Reminder.

The System shall list the events in the calendar in chronological order.

A User may add a SKU to an existing or new event or to a person listed in their Gift Reminder.

The User may remove an event from their Gift Reminder. The System will respond by removing all the persons and SKUs associated with that event.

A User may remove a person associated with an event in their Gift Reminder. The System will respond by removing the person and all associated SKUs.

A User may remove a product from a person or event in their Gift Reminder.

The User may specify to receive reminders of events, x days prior to the event, via email. If the User has associated a person, with a User profile, to the event, the System will include gift suggestions using the Gift Finder, in the email. The System will also include in the email a description of the event, a list of associated persons, and any linked products specified by the User.

If an event in a User's calendar maps to an occasion known by the System, the System will provide a link to the Internet Shopping Mall occasions page.

Sale

Discount precincts collect discounted goods offered by retailers on the Mall site.

To provide the sale function the mall Site requires:

1. List of retailers currently running 'store wide' sales.

2. List of products currently on sale, organised by category.
3. List of best selling sale items and retailers.

The sale precinct is built in the same way as all other precincts – with the additional refining feature that retailers and products are marked as being on sale or reduced.

Auctions

The auction facility is a facility for retailers to clear excess stock through an auction service. This facility:

1. Allow retailers to nominate stock items for clearance through the auction service, setting number of items, reserve price, opening bid, etc.
2. Allow users to bid on items, track progress of their bids through various devices (e-mail, pager, WAP enabled mobile phone) and pay for items through the standard Internet Shopping Mall checkout.

Features of the facility are that:

1. Part of the RMC must allow retailers to move stock items from their regular products database to an auctions database.
2. Facility to set reserve price, number of items, initial bid for each auction item.
3. Ability for retailers to real-time monitor auction progress.
4. Ability for users to get a list of auction items, by retailer, brand or category.
5. Ability for users to bid on items.
6. Facility to notify users by e-mail, pager or WAP device if their bid is ever exceeded by another shopper.
7. Integration with TFS so that payments can be handled through it.

This will most likely be implemented as a buy-in or tie-in with a third party auction site provider.

Gift Registries

The gift registries allow shoppers to compile a list of items they desire, distribute this list electronically and allows gift-givers worldwide to enter the site, purchase these gifts electronically and have them delivered directly to the recipient.

Goals & Priorities:

1. To provide a useful and intuitive infrastructure for shoppers to compile and maintain multiple lists of gifts for different events; to add, edit and delete gifts from the list; to be informed if a gift is purchased from the list; and to communicate the existence of the list to potential gift givers.
2. To provide a service for gift givers to lookup people and events; select gifts for purchase matching their desired price range; to purchase those gifts and have them shipped either to themselves or the recipient (or a nominated third party).
3. To collect information allowing the products database to evolve product profiles based on what kinds of people buy different products for given events. The system can then learn what are the most popular wedding presents, birthday presents for single women, etc. This information can be used by the Gift Finder and other areas of the site, and represents useful merchandising metrics for retailers and Internet Shopping Mall.

Supporting requirements:

1. Recipients must become registered shoppers to ensure information provided is correct and create the supporting database records.
2. The system should collect basic information about the event (eg nature of event, date and location) to ensure its accuracy and provide an accuracy check for gift-givers. This information is also useful to support goal 3 above.
3. Recipients must be able to browse the site, entering each item into the gift registry with a single click. The interface must not be modal – ie all other website functions should be unaffected and users should not be required to end the browse session to resume normal operation of the site. The 'Add to Registry' button is on the Internet Shopping Mall services block of the Internet Shopping Mall navigation bar in the current prototype, satisfying this requirement.
4. Recipients should be able to modify their gift registry at any time and add / remove any item prior to its purchase, as well as review which items have already been purchased.
5. Recipients should be able to establish an electronic list of gift-givers with email addresses and distribute the gift list by email.
6. Givers receiving the email should receive a URL and unique registry number allowing them immediate access to the gift registry, where they can review available gifts and make purchases. Gift givers should not

require a user name and password or need to be registered Internet Shopping Mall shoppers but will require the recipients surname and registry number.

7. The gift registry should automatically update when items are added or purchased.
8. Gift registry should update the product profiler, informing it as to suitable presents for particular events.
9. The basic gift registry infrastructure may be presented on the web site under various guises. For example: "Wish List," "Wedding Registry." Shoppers may therefore need to manage multiple registries however the underlying code and engine should not be replicated (simply "rebadged").

A user wishing to establish a gift registry must be a registered shopper first. The registration process only asks for information on a 'need to know' basis – so there may be gaps in the required fields at the time the user establishes a gift registry. These gaps should be filled in when the user creates their registry.

Once created the user resumes normal browsing of the site. The 'Add to Registry' button appears at all times. If a user clicks this button without being registered, they will be taken through the registration process.

Once a list is created users need to be able to create a mailing list. Manual entry is a required feature but users should also be able to upload address book files from their e-mail application where feasible.

When ready a user needs to be able to mail his or her list to the e-mail recipients. The e-mail message should contain a short greeting from the user, as well as a Internet Shopping Mall URL that points only to that registry list and unique registry number. Some attention needs to be paid to the security implications raised.

Recipients need to be able to view which gifts have already been purchased and which gifts are still available. Shoppers should be able to purchase (or add to cart) immediately from the registry page.

Recipients also need to be able to indicate acceptable quantities of individual gifts. For example, a wedding registrant will only want one fridge – however may be quite happy to receive as many flowers as people wish to buy.

Gift Reminder

The gift reminder allows users to enter in dates and events to maintain a simple calendar service to receive e-mail in advance of important dates.

Supporting Requirements:

1. Users must be registered to have access to the gift reminder feature.
2. Users can select whether or not to start with a 'blank' calendar, or one initialised with common gift giving dates (Valentine's Day, Mothers / Fathers Day, Christmas).
3. Users can enter dates and brief descriptions and view a list of upcoming dates and "shopping days left".
4. Users can add personalisation details to each person they add to their reminder calendar – so an e-mail reminder can carry immediate and relevant gift suggestions.
5. Users can toggle whether or not to receive e-mail notification of upcoming dates, and how much notice to give.

If not already registered, the user is prompted for their e-mail address and a password (confirmed via e-mail). No other registration information is asked for at this time, since it is not needed. If registered, the user logs on with their e-mail address and password.

The user can, using a single click, load common calendar dates for most gift giving occasions. They can delete scheduled events, add new events, and view which events are coming soon and how many days are left.

Users can tag gifts to any particular event. Users can add personalisation details to each person they add to their reminder calendar – so an e-mail reminder can carry immediate and relevant gift suggestions.

Common events are linked through to the Events precinct, so that shoppers can easily get Mothers Day suggestions (for example).

Gift Voucher

Ability to purchase electronic gift vouchers and send them to recipients electronically or in hard copy. This feature will most likely be implemented as a tie-in with an existing gift voucher vendor.

The Gift Voucher function:

1. Provide a service where shoppers can purchase gift vouchers redeemable at Internet Shopping Mall website and centre retailers.
2. Establish Internet Shopping Mall as the preferred avenue for redeeming gift vouchers from retailers.

Supporting requirements:

1. Ability to purchase gift vouchers by payment method at a range of values.
2. Ability to send, via e-mail, the electronic gift voucher or the hard copy voucher via post, along with instructions for redeeming the gift voucher at Internet Shopping Mall retailers.
3. The gift vouchers must be able to be offered as payment (or part payment) during the checkout process, with the voucher being validated and cancelled if used successfully.

Users can add gift vouchers to their shopping cart just like any other product, and pay for them through the same checkout process.

At the 'product page' for the gift voucher, users fill out information such as the intended recipient, preferred retailer and any messages to be added to the gift voucher when sent.

Once payment is cleared the voucher is e-mailed or posted to the recipient with instructions on how to redeem the voucher.

Part of the checkout process is selecting a payment method. Payments can be split across multiple revenue sources, including multiple credit cards and vouchers. Users select a combination of payment methods that match the total – using a gift voucher credits the purchase with those funds.

Gift Wrapping

Facility for retailers to offer gift wrapping for their products, based on their own facilities and those of the Internet Shopping Mall warehouse. The gift wrapping service:

1. Offers gift wrapping for retailers aggregating or cross-docking with the Internet Shopping Mall warehouse.
2. Allow retailers to offer, and shoppers to use, gift wrapping services as part of the ordering process. Retailers must specify the extent to which gift wrapping services are available, so that shoppers can select wrapping options from those retailers that offer it.

Supporting requirements:

1. Retailers aggregating at the warehouse can use the Internet Shopping Mall gift wrapping service. This is offered to shoppers simply as a checkbox to be marked for each product on whether or not to perform gift wrapping.
2. Retailers not aggregating at the warehouse can specify gift wrapping options and provide GIF "swatches" of wrapping paper options for consumers to chose from.

3. Ability for consumers to chose between wrapping options from retailers.
4. Ability for consumers to 'split' products within retailers so that different products can have different wrapping options within the same order from the same retailer.
5. Ability to add a gift message for each wrapped gift.
6. Ability to specify different delivery addresses for each wrapped gift.

The Giftwrapping service process involves:

- At checkout, shoppers can specify gift wrap options for each item in their cart.
- For retailers aggregating at the Internet Shopping Mall warehouse, there is a single option "gift wrap". The wrapping occurs at the Internet Shopping Mall warehouse. At launch, shoppers will not have a choice of wrapping paper.
- For retailers handling their own fulfillment, they can offer a variety of gift wrapping options. The mechanism under which this is done is a key challenge and is likely to follow a phased implementation. The ultimate goal is for retailers to be able to offer a range of wrapping paper and options, managed through the RMC or products database.

Dressing Room

The dressing room juxtaposes clothing items in the shoppers wish list so that the shopper can get an impression of how a total outfit will look together. Also provides information on how shoppers should measure to ensure accurate sizes.

The Dressing Room:

1. Inform shoppers how to predict clothing sizes accurately to minimise returns of clothing items.
2. Provide shoppers an overall impression of how a total outfit might look, to engender some confidence in selections and purchase decisions.

The Dressing Room function must :

1. Interface with wish list ('remember this') to pull out all clothing items and arrange them in 'bands' based on where on the body they fit.
2. Provide an ability to cycle through all the options in each band to 'mix and match' items.
3. Provide static help files describing how to get accurate size measurements for ordering online.

Recommendation Engine

The recommendation engine uses past purchase behavior and the shopper and product user profiles to provide shoppers with suggestions as to products which are complementary to any chosen product (ie collaborative filtering).

The recommendation engine is provided:

1. To offer value to consumers by providing useful information on related products and informing them of useful products they might not otherwise find. This is intended to increase the conversion rate and thus sales.
2. To collect profiling information on which consumer profiles are interested in which products and develop related product networks for market intelligence and merchandising metrics.

Recommendations can feature products from different merchants and across retailer categories (eg people who bought the Sony CD-ROM drive also bought 'Upgrading and Repairing PCs').

Recommendations can also be based on alignment of shopper profiles with product profiles to increase a products ranking in the recommendations list.

Products listed as recommendations contain a live link directly to the product page.

The System provides a feedback mechanism to test the appropriateness of the recommendation (e.g. simple dialog box asking if the recommendation was useful). This is an important negative feedback loop to filter out spurious connections.

When a shopper makes a purchase all the products in their cart are linked in the database, together with any past purchases. Once a particular association threshold is reached, two products might be suggested as being 'related'.

On product pages, a 'Related Products' button will call up a new Internet Shopping Mall page listing all related products.

Jump to Shop

The shop locator ('jump to shop') allows shoppers to jump directly to a given shop from any page in the site. This ensures that individual retailers are never more than 1-2 clicks away from any given part of the web site. To ensure that the web site is quick and easy to navigate and does not force users to follow a particular 'story' or path. It also increases retailer visibility

and conveys to the user the number of retailers available on the Internet Shopping Mall site.

Shops are be listed in alphabetical order in a drop-down box.

Selecting the shop automatically replaces the current page with the shop page without the need for a second click. On browsers not supporting JavaScript (or where JavaScript has been disabled) a button (eg 'Go') is provided to make sure the form is still operable.

As part of loading the page navigation structure pages will load the retailer 'quick jump' list. Functionally this is just a small form with a number of <options> to a <select> block containing short / abbreviated retailer names tied to retailer IDs.

Power Search

The search facility provides rapid non-linear access to the site and allows shoppers to categorise the search by a variety of criteria. The aim is to provide accurate and relevant search results based on product-centric search criteria to maximise the ease with which shoppers can find the products and services that they are looking for, to build a library of common search queries and the results most often selected. The product search feature is designed to never return 0 results.

The Search facility must be available from each page of the site in some form. The search should immediately execute by the user pressing the return key or a search button.

An advanced search ("power search") should be available allowing segmentation by the following criteria – product, store, brand, price, category-specific criteria as well as keywords. Searches should cover the entire site by default. A simple search should use the same underlying search engine, with neutral defaults selected for all criteria except keywords.

Search results should return with no more than 10 results in a given page. If a search results in 0 matches then the criteria should be loosened and the search repeated immediately so that the user always gets at least some results from any given search (the user should be warned that there were no exact matches and that the next closest matches are being displayed instead). Users should never receive 0 matches for a search query.

Results should be ranked only by relevance to stated criteria.

Results should return thumbnail graphics as well as the retailer's name/logo and short descriptions of products (as entered by the retailer).

Usability research shows that users often resort to a search engine when it is not immediately apparent where they should proceed from a given page. Despite users low expectations of search engines they remain a popular and often used navigation device. Given users low expectations the search facility should seek to exceed those expectations consistently and dramatically through the quality of the search results. This means using thesauri and phonetic matching as well as freeform style search queries and using the inherently structured nature of the data to maximise relevance.

Shoppers specify a search query ('I am looking for products' or 'I am looking for retailers' or 'I am looking for brands'). Query is fielded with some standard fields.

The search engine will use phonetic matching (eg metaphone algorithm) to catch phonetic spellings (or misspellings) and partial matches to catch 'off by one' misspellings. The search engine will also need a thesaurus available to it.

The search engine will never present 'no results' – it must fall back to a slightly broader search until some results are found.

It should be noted that most document / concordance-based search engines are poorly suited to e-commerce applications and should be avoided. This is because they are designed to be document indexers – a problem domain quite different to finding products in a collection of retailer databases.

Shop Together

The shop together service allows shoppers to 'join together' and shop online – each member shopper's click notifying all members of the group of the location of a particular member. Groups are likely to be limited to 2-3 people. This function:

1. Increases both traffic and conversions by providing a shared experience for shoppers, which will increase shopper confidence in purchases and increase transaction volumes.
2. Provides community-style services to counter-act some of the perceived negatives of shopping on-line.

A 'shopping group' can be formed by a single registered shopper naming the group and entering a short description.

Subsequent shoppers must actively elect to join a 'shopping group' – but they do not need to become registered shoppers. The group founder can invite users to join the group via e-mail (with an included URL).

When a shopper joins a group, they are taken to the shop / service where the current group resides. Each member can browse independently however, moving about the site and communicating with other members utilising an in-browser chat window.

Any member of the group can request the group's attention by clicking a 'look at this' button – providing an optional hyperlink to the requestor's current page. This would appear in the chat window which, when clicked, would load the new page mentioned.

Registered shoppers can schedule new group shopping visits on their shopping calendar and send email notification to members of the group

E-commerce sites do not always engender confidence in purchases, contributing to a high degree of abandoned shopping carts. Enabling collaborative shopping would increase confidence in purchases and lessen the percentage of abandoned shopping carts.

It is also clear from market research that most people shop with a partner or friend in the real world. The feature is novel (at least in the Australian market) and allows for a shared and fun experience (increasing traffic) and collaborative, informed purchases (increasing conversions).

A large percentage of traffic originates in referrals from existing users. This feature provides both an avenue and trigger for referrals and an incentive for people to follow the referral and visit the site.

For users to Shop Together:

- User 'A' clicks on "Shop Together" and is asked to register (if not already registered) or log in (if registered) with their e-mail address to establish their shop together session. They are also asked to provide a short description of the group they wish to start. User A then resumes normal browsing of the site, with a chat window appearing next to the browser to facilitate group chatting, and an 'e-mail friend' button to invite other users to join.
- User B either receives an e-mail from User A (with URL to join the shop together session), or clicks the 'Shop Together' button on the Internet Shopping Mall site and enters the e-mail address of the user running the session they wish to join. Once established they are part of the session and can type messages into the chat window to communicate in real-time with the other users.

- All users in the shop together session can browse independently, but can call attention to particular web pages (and hence products) by clicking the shop together button on each page – this sends the URL to the chat window which other users can click on to load that page.
- The session is ended when all users 'log off' or the session remains idle for one hour.

Recommendation Engine

This component may be embedded in product details pages for providing recommendations for other similar products.

Functional Requirements

Given a single product, the System will return a list of the most common products purchased by Users who also purchased this product. If a product has not been purchased before, the System will respond with zero recommendations.

The System will search by analysing all products associated with all Users who have purchased this product. The System will then filter the results based first on the number of matches found, followed by the User profile criteria, if any exist.

The retailer will be responsible for displaying the results.

Voting

This feature allows the user to answer various survey questions, which are recorded for marketing purposes. The following principles apply to this function:

The User will not be asked the same question twice.

The User will not be asked multiple questions at any one time.

The User will only be asked questions which can only be answered by single choice.

The System will display the results of the poll once the User has submitted a response.

If the User does not select an answer the System will display an error message.

The System will display a single question with multiple responses and a "vote" button or link.

The System will display the results of the poll in a graphical format by percentages.

My Internet Shopping Mall (Customisation) (Common)

Personalised precincts collecting shop fronts, promotions and content around particular interests of registered shoppers.

The My Internet Shopping Mall function is used to provide a customised, personalised page for shoppers, with shoppers gaining control over the selection and display of key site content, and to build and develop the shoppers profile by encouraging user logon, repeat visits and incremental profiling.

The system requirements to achieve this function are:

1. Key content relating to the particular shopper profile
2. Live-linked list of best-sellers relevant to shopper profile.
3. Initial registration must consist of no more than 10 questions, and must provide registered shoppers with a password, using their e-mail address as their username.
4. Ability to create an e-wallet: the collection of credit card information (and when technology allows, debit card information) so that users need only enter credit card details once.
5. "What's New" service displaying a list of new features added since the users last visit (generated from the CMS).
6. The development of the user profile should be incremental. Coarse-grained profiling based on the very first product purchases or responses to survey questions at registration would be refined over time based on pages visited and products bought. Further refinements are possible through single question user surveys run from precinct pages.
7. Users should be able to customise colours, select their favorite retailers explicitly as well as manage account information (track orders, view purchase history, create and edit gift registries and manage e-mail list subscriptions).

The My Internet Shopping Mall page offers a strong incentive for repeat visits and allows targeted merchandising to increase both traffic and conversion rates. It also represents an opportunity to build a rich user profile database for marketing and business needs.

A first time user may click on the 'Join In' button and be invited to register. They enter their e-mail address and nominate a password (confirmed via e-mail) as well as answer 10 questions on shopping interests. This is used to build an initial profile across price sensitivity, time sensitivity, fashionability and life stage.

Alternatively, a shopper may complete this registration process as part of their first purchase. In this case, initial user profile is taken from their first product purchases.

Once activated the My Internet Shopping Mall page displays the same navigation bar (with the ability to "roll it up"), with retailers, brands and products being displayed based on those settings. Links are provided displaying summary information on gift registry status, wish list status, gift reminders and other services listed in this section.

The ability to link retailer-specific services for registered users must be provided. Retailers need to be able to define content targeted at individual users on an automated basis. This functionality is negotiated with the individual retailers before hand however. Example: A CD retailer may publish a 'top 40' channel, that registered users can add to their My Internet Shopping Mall page. The links in the CD list go through to the retailers product pages.

Retailers also need to be able to offer specials to registered users only, and notify registered users through e-mail and their My Internet Shopping Mall page of the specials available.

Recommendation Engine

The recommendation engine should use past purchase behavior and the shopper and product user profiles to provide shoppers with suggestions as to products which are complementary to any chosen product (ie collaborative filtering). The aim of providing a recommendation engine is:

1. To offer value to consumers by providing useful information on related products and informing them of useful products they might not otherwise find. This is intended to increase the conversion rate and thus sales.
2. To collect profiling information on which consumer profiles are interested in which products and develop related product networks for market intelligence and merchandising metrics.

Recommendations can feature products from different merchants and across retailer categories (eg people who bought the Sony CD-ROM drive also bought 'Upgrading and Repairing PCs').

Recommendations can also be based on alignment of shopper profiles with product profiles to increase a products ranking in the recommendations list.

Products listed as recommendations should contain a live link directly to the product page.

System should provide a feedback mechanism to test the appropriateness of the recommendation (eg simple dialog box asking if the recommendation was useful). This is an important negative feedback loop to filter out spurious connections.

When a shopper makes a purchase all the products in their cart are linked in the database, together with any past purchases. Once a particular association threshold is reached, two products might be suggested as being 'related'.

On product pages, a 'Related Products' button will call up a new Internet Shopping Mall page listing all related products.

Back End Services

The following modules do not represent user-visible functionality, but provide supporting technical infrastructure for other aspects of the web site.

Personalisation

Personalisation is a pervasive feature of the site, influencing many features from checkout and payment defaults through to the operation of the recommendation engine and gift finder and the selection of retailers and products to display on precinct pages. The aim of these services is :

1. To provide a framework and delivery mechanism for targeting content and products based on correlations with consumer profiles in a seamless and business-oriented way.
2. To build a database of consumer profiles for demographics and marketing research.
3. To add value for consumers by targeting relevant content most closely matching their needs and requirements.

Users and products are keyed along the following criteria: price sensitivity, fashionability, gender, life stage and time sensitivity. Initial values are neutral across all criteria.

Criteria must be settable either explicitly (for example, retailers profiling their own products) or implicitly (for example, products aligning themselves to profiles if they are bought often enough by a certain profile of user).

Criteria must tend to neutral if no clear trend emerges.

Business rules must be able to be set by non-technical staff guiding the display of products and content.

Retailers must be able to set initial values for the four features of a product.

Each criteria represents a continuum from –100 (not at all, or negative) to +100 (very much so, or positive). Gender and life stage are set to discrete values although intermediate values are possible.

Reviews & Voting

Another specialised content tool. Reviews are a CMS for users attached to products. Voting is a content requirement with unique implementation issues. The aim of the Reviews and Voting Function is to:

1. Provide a facility that users and retailers can add reviews to products, view those reviews, and delete offending reviews.
2. Provide a facility so that the Internet Shopping Mall can establish small surveys and collect aggregate results which are displayed in real-time to site users.

Profile Building

Profile Building tracks the shoppers interaction from initial site entry. It uses the concept of session profile, permanent profile and session profile history to optimise how the Internet Shopping Mall acts to a specific shopper. The decoupling of session profile to permanent profile is done to allow sessions to vary markedly but for a long term pattern to be determined.

Fulfilment Transaction Server

Order Tracking

Order Tracking is a feature to allow users to view and amend their orders. This feature is provided for a User to view the status of their order. They may also cancel unshipped orders from this page. If the TFS is down, the System will display a message that "Order Tracking" is temporarily unavailable and to return later. If the User requests an order from the TFS that is invalid, the System will respond with an error message.

The User may cancel an item from the displayed order if the status is "Pending" or "Paid". A User may cancel an item by clicking on the "Cancel" button next to the item. The System will respond by removing the item from the order list, notifying the TFS server, accepting a change of order confirmation from the TFS, displaying a confirmation to the User, and

updating the total price. If the TFS rejects the request to cancel an order, the System will respond with an error message.

A User may cancel all items in a consignment if and only if none of the items in that consignment have been picked/packed. If the User clicks on "cancel all", the System will respond by sending a message to the TFS requesting that the TFS cancel the consignment.

If there are insufficient funds for the order, the System will display a message "Insufficient Funds" and the following fields to allow the User to change payment details:

Card Type
Card Number
Expiry Date

The System will display the necessary fields for changing payment if and only if the TFS responds that insufficient funds are available.

If the TFS rejects the change of payment request, the System will respond with an error message and display the change payment fields as before.

Interface Requirements

If a User is not logged in or partially logged in and selects to view their order, the System will show the following order details grouped by consignment then retailer:

1) Consignment Number (per consignment)
2) Retailer
3) Short Description
4) Quantity
5) Wrapping Details
6) Shipping Status
7) Login Button
8) "Link to Call Centre" Button

If User is logged in, the page will display all of the above (except login button) and the following:

1) Courier Number (per consignment)
2) Delivery Address (per consignment)
3) Price (per item)
4) Payment Type
5) Cancel (per item)

6) Cancel All (per consignment) if and only if none of the items included in the consignment have been picked/packed.

The System will display one of the following shipping status types for each item:

1) Pending
2) Paid
3) Picked and packed
4) Left warehouse
5) Courier
6) Proof of delivery
7) Cancelled

The System will retrieve the information required for this feature from the TFS Server.

The User may only associate one credit card with one order at a time.

If a User changes their payment details, the TFS will perform a credit check on the order and respond with the status of that check.

Order Status

The order status service allows querying of orders to monitor progress and respond to shopper inquiries. This service aims to:

1. Provide real-time order status information to retailers, contact centre and logistics partners covering all retailer orders and allowing retailers to monitor the progress of outstanding deliveries to respond to customer inquiries.

2. Allow retailers to monitor performance of their own fulfillment providers delivery times.

The service provides:

1. Restricted access to order history using retailer password and the customers order ID. Alternatively, the retailer may look up an order ID by customer name. When viewing an order, the retailer does not see products from other retailers that were contained in the order, however they do see if there are dependencies that are holding up delivery.
2. Ability to view order history.
3. Access to electronic facilities for querying current status of an order.

4. Real-time access to resources (eg phone) for checking order progress.

Retailers logon to the RMC and access the order status section of the site.

Retailers call up outstanding orders, or can view the full order history in summary form.

If acting on a customer enquiry, retailers can type in the customer's order ID to view the retailers portion of the order (with a summary of other retailers goods which make up the aggregate order). If the customer does not know the order number, then the retailer may look it up using the customers name and address.

The retailer should be able to see the fulfillment providers status report on the shipment, and be able to contact the fulfillment provider to make follow up inquiries.

Transaction Fulfillment Server (TFS)

The transaction fulfillment engine processes a transactions through each of the relevant gateways. The TFS:

1. Provides a high availability, robust and reliable server platform from which to manage the three stages of a purchase: transaction / payment; retailer notification; fulfillment.
2. Provides a single API / interface for the web server to use, removing the complexity of the disaggregation of a transaction from the web server logic and modularising the complexity to make the process more manageable.
3. Provides a single point of control for security and auditing purposes.
4. Utilises all existing registered and cookie information to make initial intelligent guess as to delivery and payment information
5. Queries product database to ensure sufficient stock is available and reduces stock level accordingly
6. Processes each merchant transaction sequentially and separately, ensuring the Internet Shopping Mall remains beyond the transaction from a liability standpoint
7. Notifies the user on the interim screen as each transaction is processed and approved

8. If all transactions are successful, generates an order to retailer through retailer gateway
9. If all transactions not successful, re-adjusts the stock levels and returns to shopper to ask for another payment method or to adjust purchase list for items not already purchased
10. When retailer has stock prepared, notifies the system through the retailer gateway and engine notifies retailer's fulfillment partner
11. When fulfillment partner picks up product, notifies site through fulfillment gateway
12. When product successfully delivered, fulfillment partner notifies site
13. If delivery not successful, fulfillment partner notifies site and returns product to storage location for pick-up / redelivery
14. E-mail notification of retailers to deal with delivery rescheduling or other resolution.

Operation of the TFS:

- First, payment is cleared via the transaction gateway. The gateway disaggregates the transactions, and clears payment for each retailer into their merchant accounts. The gateway handles any retries or timeouts and reports results in an aggregate form back to the web server.
- Assuming payment is cleared the TFS next notifies the retailer through the RMC or e-mail that an order has been received and payment cleared. Retailer must confirm stock availability and ship the item with their own fulfillment provider, or approve the filling of the order from the Internet Shopping Mall warehouse. If there are problems here the shopper must be notified by e-mail and their My Internet Shopping Mall page.
- Assuming goods are shipped the Internet Shopping Mall warehouse (or retailers other fulfillment provider) must take the goods, pack all constituent items into one unit and then deliver to the shopper. Fulfillment providers must report status of shipment up until proof of delivery (POD).

The three stages are dealt with in more detail below.

Transaction Interface

The transaction router (sometimes referred to as the 'pseudo-gateway') provides the interface between the Internet Shopping Mall and the gateway providers. The interface is designed to:

1. Provide a secure, robust and reliable mechanism for clearing of payments to retailer merchant accounts.
2. Generate audit logs for fraud detection and investigation.
3. Support multiple transaction gateways and banks where feasible.

Supporting requirements:

1. Provide access to all major banks.
2. For each retailer, support a primary account through which to clear transactions, and a backup account at a different bank in case the primary is down or unavailable. Also support a primary gateway that is the retailers or the Internet Shopping Mall's preferred gateway, and a backup gateway if the primary is down or unavailable.
3. Sequentially manages multiple authentication's / payments within a transaction. Automatically handles timeouts and retries.
4. Permits rollbacks of authentication in case of mistaken transaction.
5. Supports full range of status feedback from acquiring banks and gateways.
6. Support multiple payment methods, including multiple credit cards, gift vouchers or loyalty point redemption.
7. Supports delayed transactions where products must be back-ordered. Users notified by e-mail that that portion of their order has not been charged.

Operation of the Transaction Interface:

- (This part of the site is more properly called the transaction router.)
- An aggregated XML transaction request object is received from the web site by the TFS. The TFS disaggregates the transaction and the transaction router feeds a series of single transaction request objects (one for each retailer) to the gateways (in the format they expect).
- As responses come back from the gateways they are reaggregated by the transaction router, which formats a new XML transaction response object to be fed back to the web site via the TFS.
- Gateways receive transaction requests either in the Internet Shopping Mall XML format (if supported) or in their own proprietary format (as converted by the pseudo-gateway).
- Gateways return status codes on each transaction. They can either return in XML format or their own proprietary format (which will be converted to XML by the pseudo-gateway).

Fulfillment Interface

The fulfillment gateway provides the interface between the Internet Shopping Mall and the fulfillment partner.

Supporting requirements:

1. Scale of current charges accessible electronically
2. Fulfillment request capable of electronic delivery and electronic receipt
3. Fulfillment status capable of electronic tracking and updating
4. After a retailer has approved an order and payment been processed the warehouse must be notified to pick, pack and ship the order.
5. From then on the couriers will need to send back status updates as the order progresses to POD.

1.1 Dictionary of Terms and Abbreviations

Term	Definition
846	A 3PP EDI message. Stock Reconciliation Process. Synchronises agreed inventory levels between supply chain information systems.
850 - Outbound Sales Order	A 3PP EDI message. This is split by the retailer and describes the items required for delivery.
856 - Manifest	A 3PP EDI message. Provides status on items ready for shipping. See also: ASN.
888	A 3PP EDI message. Amend the stock SKU catalogues for a retailer. Typically sent from a retailer to a warehouse to notify addition of new stock codes.
Acquiring Bank	The financial institution responsible for maintaining merchant bank accounts.
Aggregating Stock Provider	Synonym of Central Warehouse.
App Server	Application Server. Synonym of WIST Front end.
ASN	Advance Shipping Notice. Also known as an 856 EDI Message.
Assumed Delivery	A delivery that is assumed to have occurred after a specified amount of time has elapsed since the goods were dispatched. This kind of delivery assumption will be made for delivery agents who

	have no means of informing TFS of the status of goods being delivered.
Authorise funds	An initial step in a two-phase financial settlement process. 'Freezes' or holds funds ready for final settlement.
Back Order	A customer order for goods currently not in stock.
Call Centre	An area of Internet Shopping Mall that assists customers over the telephone. Call Centre operators use the CRM.
Cancelled Order	An order that is cancelled by the shopper or by the system administrator
Capture funds	The process of debiting funds from an account. In a two-phase settlement, this process will follow a prior funds authorisation. See also: Authorise funds.
Central Warehouse	A managed central store of goods from multiple retailers
Centralised Fulfilment Model	A fulfilment model where the stock provider is a central warehouse and the delivery agent is a common delivery agent organised by Internet Shopping Mall. Also known as Model 1.
Collection	This refers to the processes of a shopper collecting goods from a collection point.
Collection point	A physical place where a customer can request to fetch their purchase e.g. malls. Internet Shopping Mall defines these points.
Common Delivery Fulfilment Model	A fulfilment model where the stock provider is a retailer and the delivery agent is a common delivery agent organised by Internet Shopping Mall. Also known as Model 3.
Completed Order	An order that has been successfully completed. No items are still waiting to be fulfilled.
Connote	See: Consignment Note
Consignment Note	Identifier for a group of packages being delivered together.

Courier	Synonym to Delivery Agent.
CRM	Customer Relationship Management System.
Cross Dock	The process of moving goods from a retailer's warehouse to the central warehouse.
Cross-docked Fulfilment Model	A fulfilment model where the stock provider is the retailer and the central warehouse. In this model the retailer cross docks goods to the central warehouse and the delivery agent is a common delivery agent organised by Internet Shopping Mall. Also known as Model 2.
Customer	Synonym of Shopper
Delivery	This is the process of delivering goods to a shopper at the their nominated address.(Note the nominated address could be a collection point)
Delivery Agent	Responsible for delivering goods to the customer or to a selected pick up point.
Delivery Provider	Synonym of Delivery Agent.
Delivery Service Level	The level of expediency required by the customer for the delivery of their ordered goods. An example of the level is during the day, after hours etc
Dispatched	This is the process of the warehouse handing over goods to the delivery agent. Every dispatch should have a corresponding loaded.
EDI	Electronic Document Interchange. A messaging standard used for supply chain management. A "850" purchase order is one such message.
Financial Institution	A bank or credit union responsible for maintaining customer accounts and accepting financial transactions between them.
Financial Switching Provider	A service provider with dedicated communication links to common financial institutions and their networks. Provides automated routing of financial transactions to their intended recipients.
Front end	Synonym of Internet Shopping Mall Front End.
Fulfilment	The process of picking, packing and shipping

	ordered items to a shopper. Fulfilment covers the process from preparing goods to the shopper receiving the goods ie it is the combination of the provisioning process, the delivery process and the collection process.
Fulfilment Provider	Anyone on the Supply Chain - i.e., a Stock Provider or a Delivery Agent
Fulfilment Chain	The group of parties who participate in the ordering and fulfilment process, excluding the shopper.
Issuing Bank	The financial institution responsible for issuing a payment instrument to a shopper.
Item	A physical item. Has an SKU.
Loaded	This is the process of the delivery agent collecting goods from a warehouse. Every dispatch should have a corresponding loaded.
Manifest	A delivery note for a specific delivery. A manifest is a single delivery for a consignment note.(Confirm)
Merchant	Synonym of Retailer

Order	Request from a customer for the purchase and delivery of selected goods
Package	A package is a physical box of items for shipping. Has an SSCC. A package will contain one or more items.
Payment Gateway	A dedicated piece of computer hardware used to securely communicate with a financial institution or Financial Switching Provider.
Payment Instrument	Synonym of Payment Method.
Payment Method	Types of payment e.g., credit card, debit card, loyalty points, gift vouchers etc
Payment Type	Synonym of Payment Method.
PFG	Pseudo Fulfilment Gateway
Pick and Pack	Process of selecting items and packing them ready for collection and delivery
POD	Proof of delivery
POP	Proof of pickup
POS	Point of Sale system.
PPG	Pseudo Payment Gateway
Provision Request	Request to the warehouse to prepare items for delivery.
Provisioning	The process of picking and packing items for dispatching. See Provision Request.
Purchase Order	See Fulfilment Request
Refund	See Return funds.
Rejected Order	An order that is not able to be complete. A rejected order is not fulfilled.
Re-route transaction	The process of trying alternative routes to a Payment Gateway
Retailer	Provider of goods for sale.
Retailer Responsible Fulfilment Model	A fulfilment model where the stock provider is a retailer and the delivery agent is organised by the Retailer. Also known as Model 4.

Retailer warehouse	Warehouse managed and owned by a single retailer
Re-try transaction	The process of trying alternate Payment Gateways or Banks
Return funds	A capture funds transaction with a negative amount.
Reversal	A reversal transaction is the reversal of a capture funds transaction. This "undoes" the capture funds.
Rollback	Either a reversal or a return transaction depending on the timing of the rollback.
Settlement Provider	Settles financial transaction requests or otherwise forwards the transactions on to entities who can. (e.g.: A Financial Switching Company, A Financial Institution, An Incentive Scheme provider (e.g.: Freq. Fliers)
Shipped	See Dispatched
Shopper	User of the Internet Shopping Mall Shopping site to purchase goods.
Shopper Order	Synonym of Order.
SKU	Stock Control Unit. Individual Item Identifier for a product defined by the retailer.
SSCC	Serial Shipping Container Code. Unique identification number that identifies a package for shipping.
Stock Loss	This refers to items that are damaged or lost at the warehouse or in transit.
Stock Out	This refers to items that are temporarily not in stock at a stock provider. The items were expected to be there.
Stock Provider	A location where stock items are stored, prior to shipping. Examples of stock providers are central warehouse and retailer warehouse.
TFS	Transaction and Fulfilment Server
Track and Trace	Ability to monitor the status of the delivery of goods.

Web Server	Server responsible for content
Internet Shopping Mall Front End	The portion of the Internet Shopping Mall System that interacts with the shopper. This is a trusted source for TFS of orders requiring processing.
3PP	3rd Party Pr. - Central Warehouse provider.
DFE	Discount Freight Express. Courier company.
ETC	Electronic Trading Concepts
Home Runs	Courier company
SMG	Services Management Group
Buy Now or Quick Buy	A user with a purchase history may perform a 2 click order.
Cart or Shopping Cart	A collection of items for a particular user awaiting to be checked out.
Consignment Number	The identification number assigned to each delivery from the warehouse to a single delivery address, regardless of the amount of boxes delivered.
Consignment	A "box" of items grouped together from the same warehouse, going to the same delivery address
Courier	The item is in the hand of the courier service
Event Code	A unique identification number the system uses to identify an event in the Gift Registry. The Owner of the Gift Registry may allow this number to be used by Users to gain access to his/her Gift Registry
In Stock	If a SKU is available to be picked and packed and then shipped
Item(s)	A product SKU with a quantity associated
Left warehouse	Shipping status of an item in an order that has been shipped to the user's delivery address
Logged In	A registered user who has submitted an email address and password and has been verified by the system. A logged in user will have full access to his/her account

Order Number	The entire transaction's identification number
Out of Stock	If a SKU is unavailable because the stock level has fallen below an alert level or the SKU is completely out of stock at the warehouse
Paid	Shipping status of an item in an order that has been charged against a user's credit card
Partially Logged In	A registered user who has submitted an email address but no password. A partially logged in user will have partial access to his/her account
Pending	Shipping status of an item in an order waiting to be paid and then picked and packed
Picked and Packed	Shipping status of an item in an order that has been picked of the shelf and packed into a box
Proof of Delivery	The goods have been delivered and a signature on delivery has been received
Purchase History	A user who has made at least 1 order will have a purchase history. A purchase history contains order data, personal data, gift wrapping preferences and payment details
Registered User	A user who has submitted personal information to gain access to special functions of the site
Retailer	An entity containing many products. Each retailer is part of a Internet Shopping Mall precinct
Session Timeout	The period of time that elapses that denotes the user is no longer active
Session	The period of time that the user is devoted to activity on the site
Shipping Option	The choice between "Express" or "Standard" delivery. Appropriate charges are adjusted
Stock Keeping Unit (SKU)	A unique identifier for a product which has specific attributes

TFS	Transaction and Fulfilment Server
Tracking Number	A unique identification number used to track multiple consignments after the payment has been fulfilled
User	A customer who is browsing the Internet Shopping Mall web site, types of users can be a registered, unregistered, logged in or partially logged in

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

Dated this thirtieth day of June 2000

Westfield Limited
Patent Attorneys for the Applicant:

F B RICE & CO

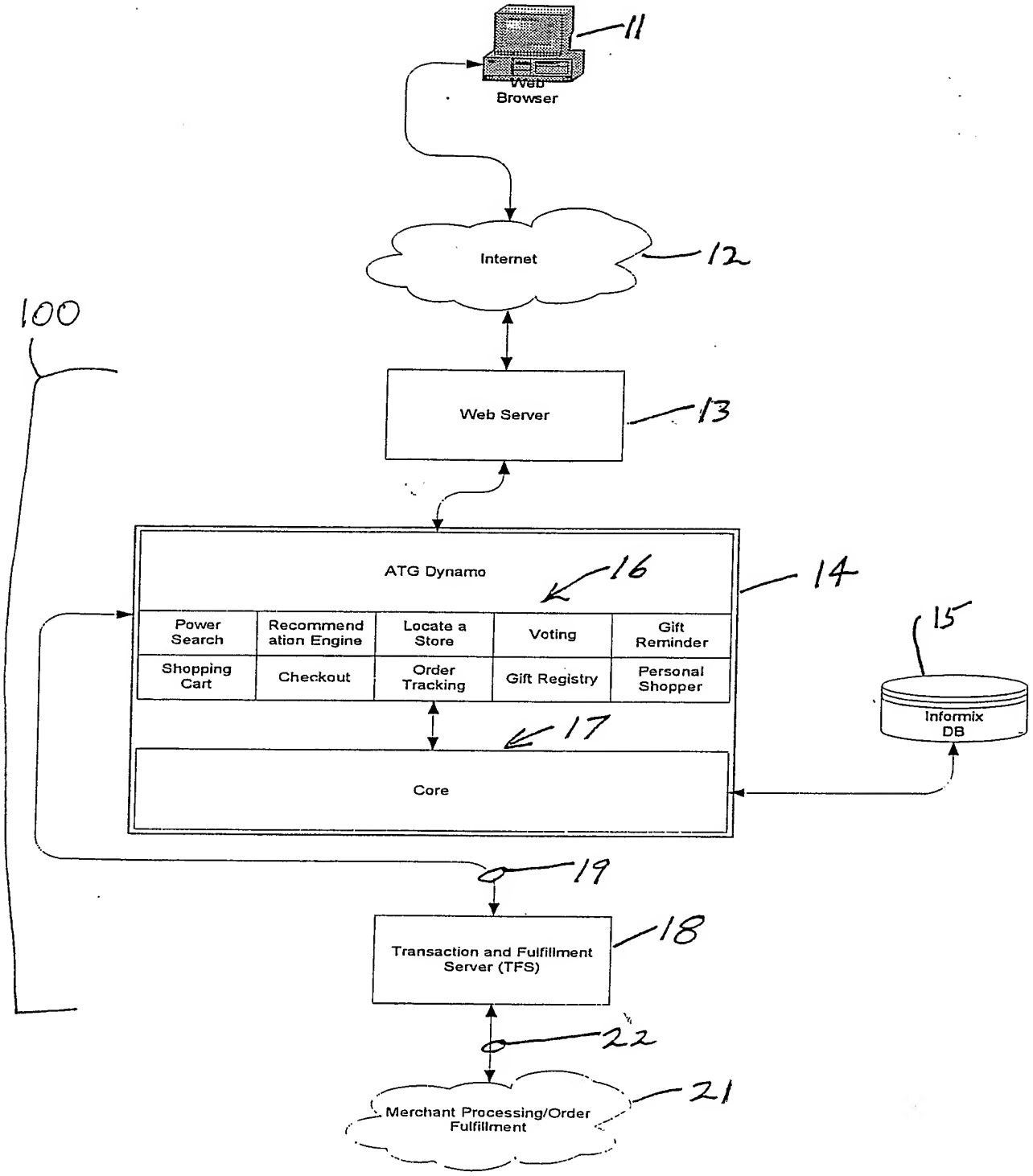
11
Web Browser
Internet
12
100
Web Server
13
ATG Dynamo
16
14
Power Search
Recommend ation Engine
Locate a Store
Voting
Gift Reminder
Shopping Cart
Checkout
Order Tracking
Gift Registry
Personal Shopper
15
Informix DB
17
Core
19
Transaction and Fulfillment Server (TFS)
18
22
Merchant Processing/Order Fulfillment
21

FIGURE 1

INTERNET SHOPPING
LOGICAL SITE ARCHITECTURE

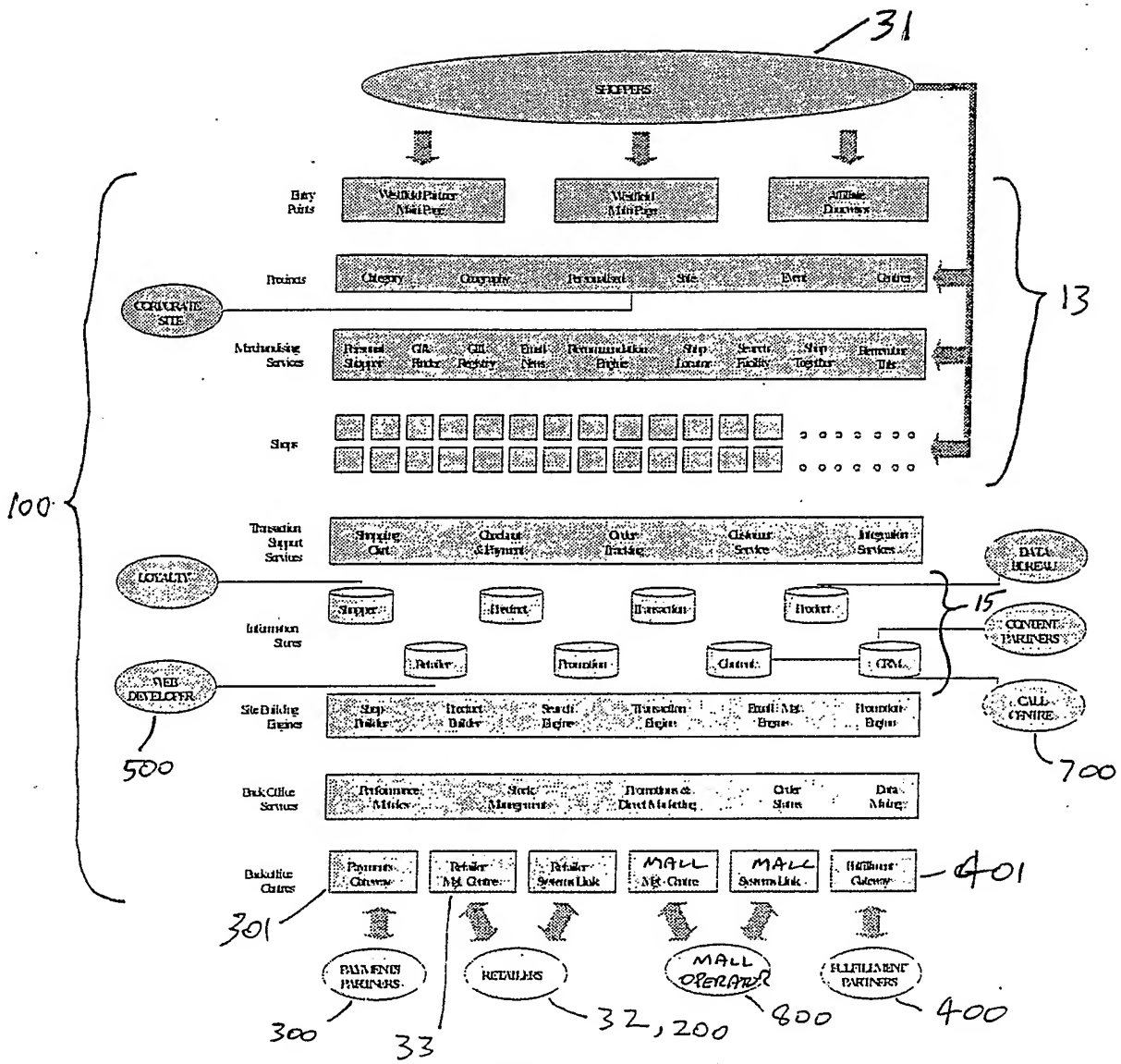

FIGURE 2

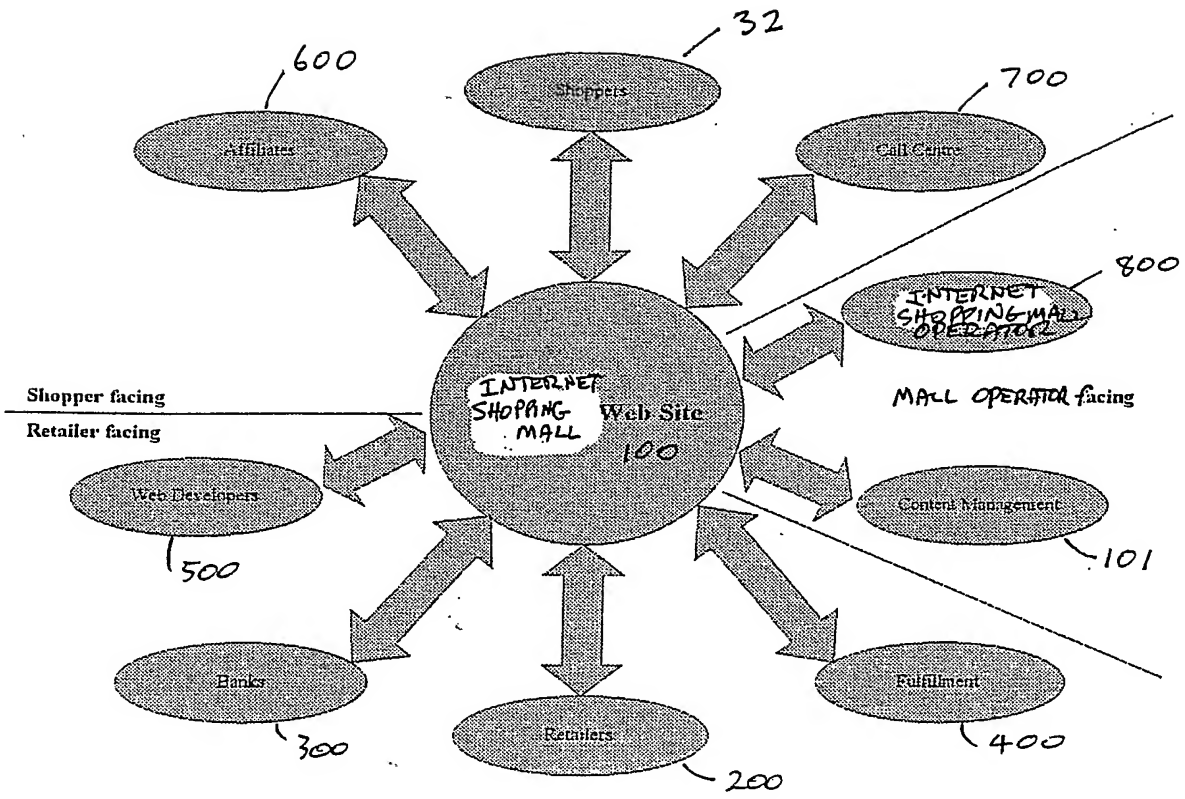
32
600
700
800
Shoppers
Affiliates
Call Centre
INTERNET SHOPPING MALL OPERATOR
Shopper facing
Retailer facing
INTERNET SHOPPING MALL
Web Site
100
MALL OPERATOR facing
Web Developers
500
Content Management
101
Banks
300
Retailers
200
Fulfillment
400

FIGURE 3

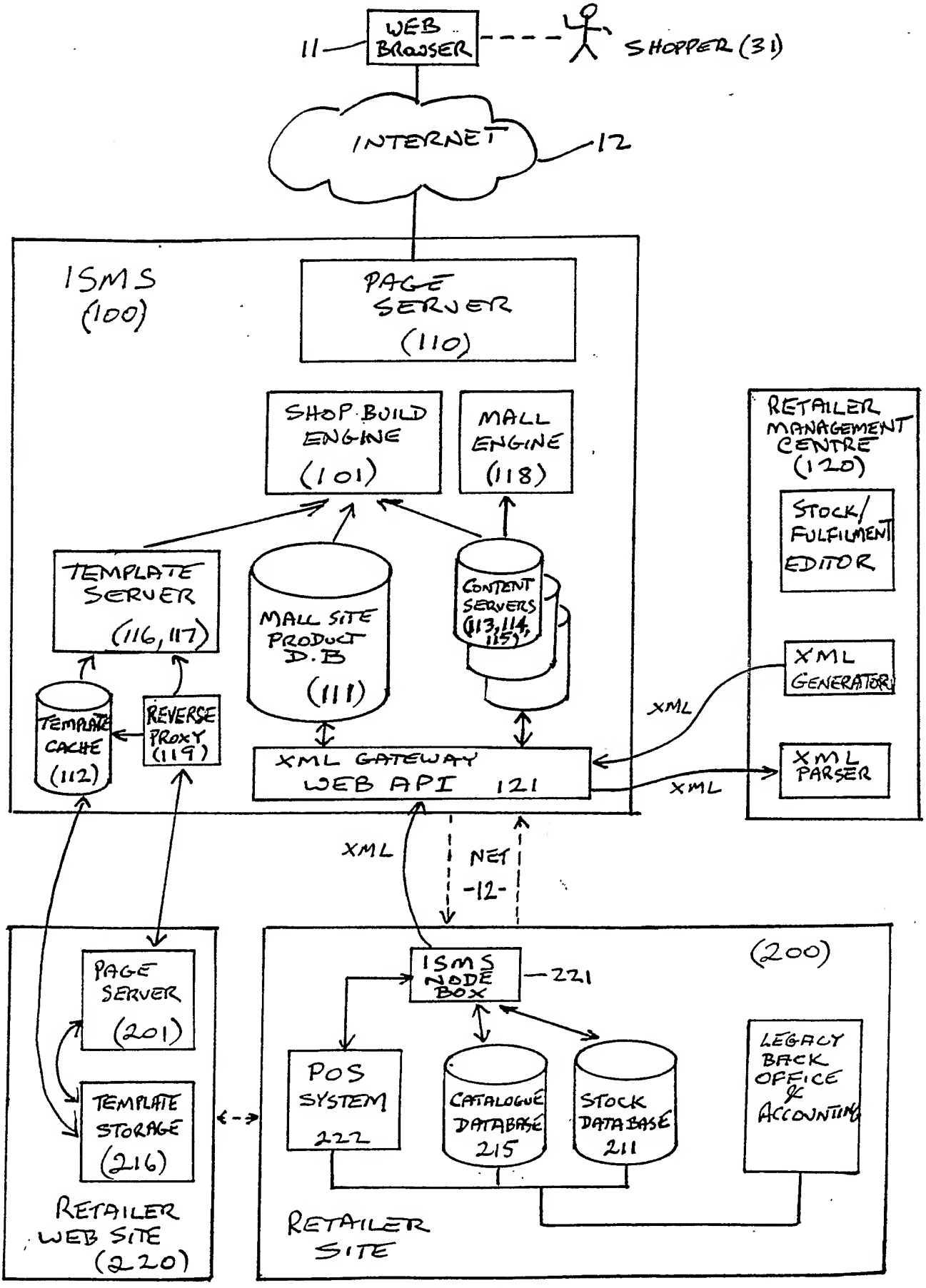
11
WEB BROWSER
SHOPPER (31)
INTERNET
12
ISMS (100)
PAGE SERVER (110)
SHOP BUILD ENGINE (101)
MALL ENGINE (118)
RETAILER MANAGEMENT CENTRE (120)
STOCK/ FULFILMENT EDITOR
TEMPLATE SERVER (116, 117)
MALL SITE PRODUCT D.B (111)
CONTENT SERVERS (113, 114, 115)
XML GENERATOR
XML
TEMPLATE CACHE (112)
REVERSE PROXY (119)
XML GATEWAY WEB API 121
XML PARSER
XML
XML
NET -12-
(200)
ISMS NODE BOX
221
PAGE SERVER (201)
TEMPLATE STORAGE (216)
POS SYSTEM 222
CATALOGUE DATABASE 215
STOCK DATABASE 211
LEGACY BACK OFFICE & ACCOUNTING
RETAILER WEB SITE (220)
RETAILER SITE

FIGURE 4

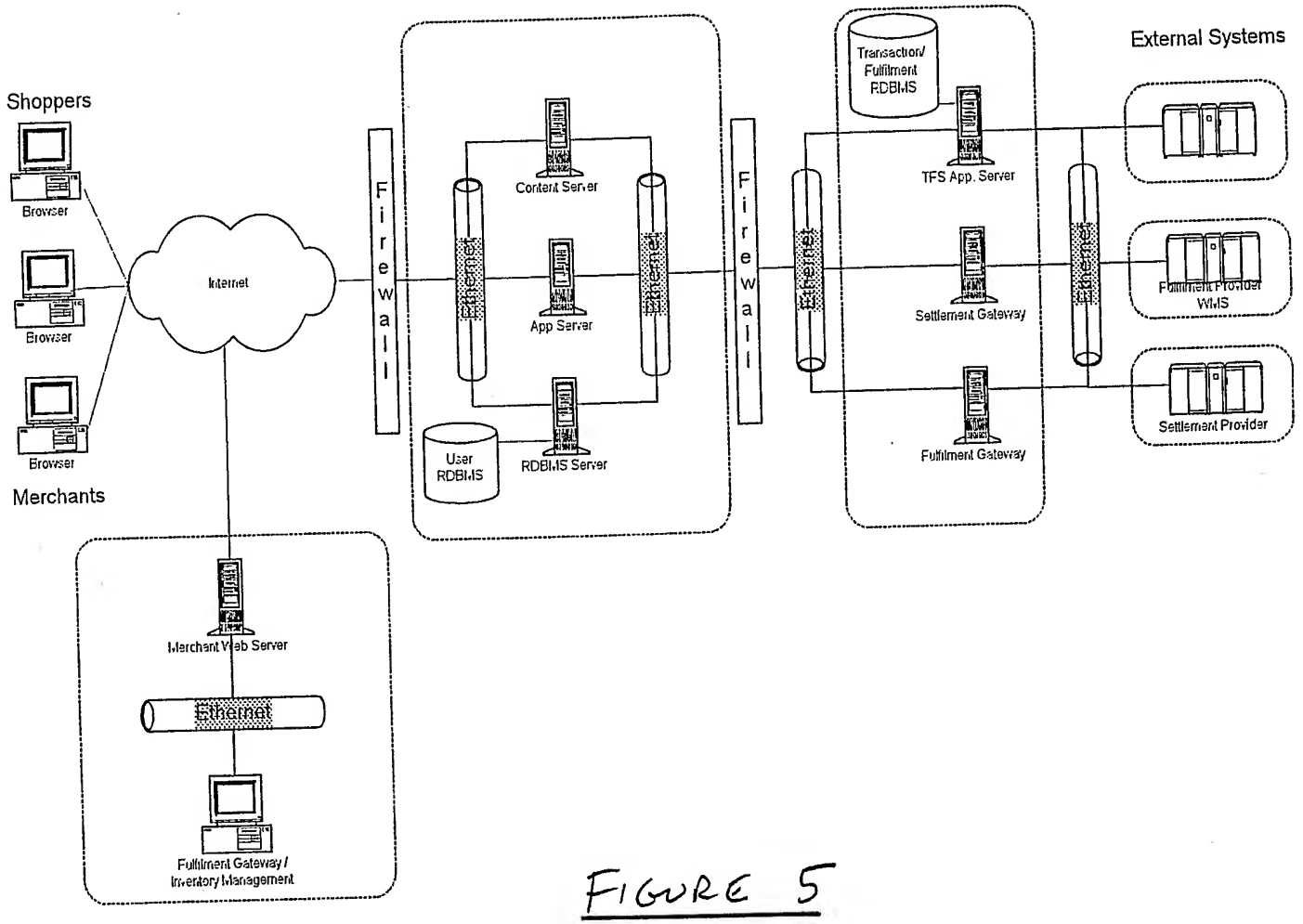
Shoppers
Browser
Browser
Browser
Merchants
Internet
Firewall
Ethernet
Content Server
App Server
RDBMS Server
User RDBMS
Firewall
Ethernet
Transaction/ Fulfilment RDBMS
TFS App. Server
Settlement Gateway
Fulfilment Gateway
Ethernet
External Systems
Fulfilment Provider WMS
Settlement Provider
Merchant Web Server
Ethernet
Fulfilment Gateway / Inventory Management

FIGURE 5

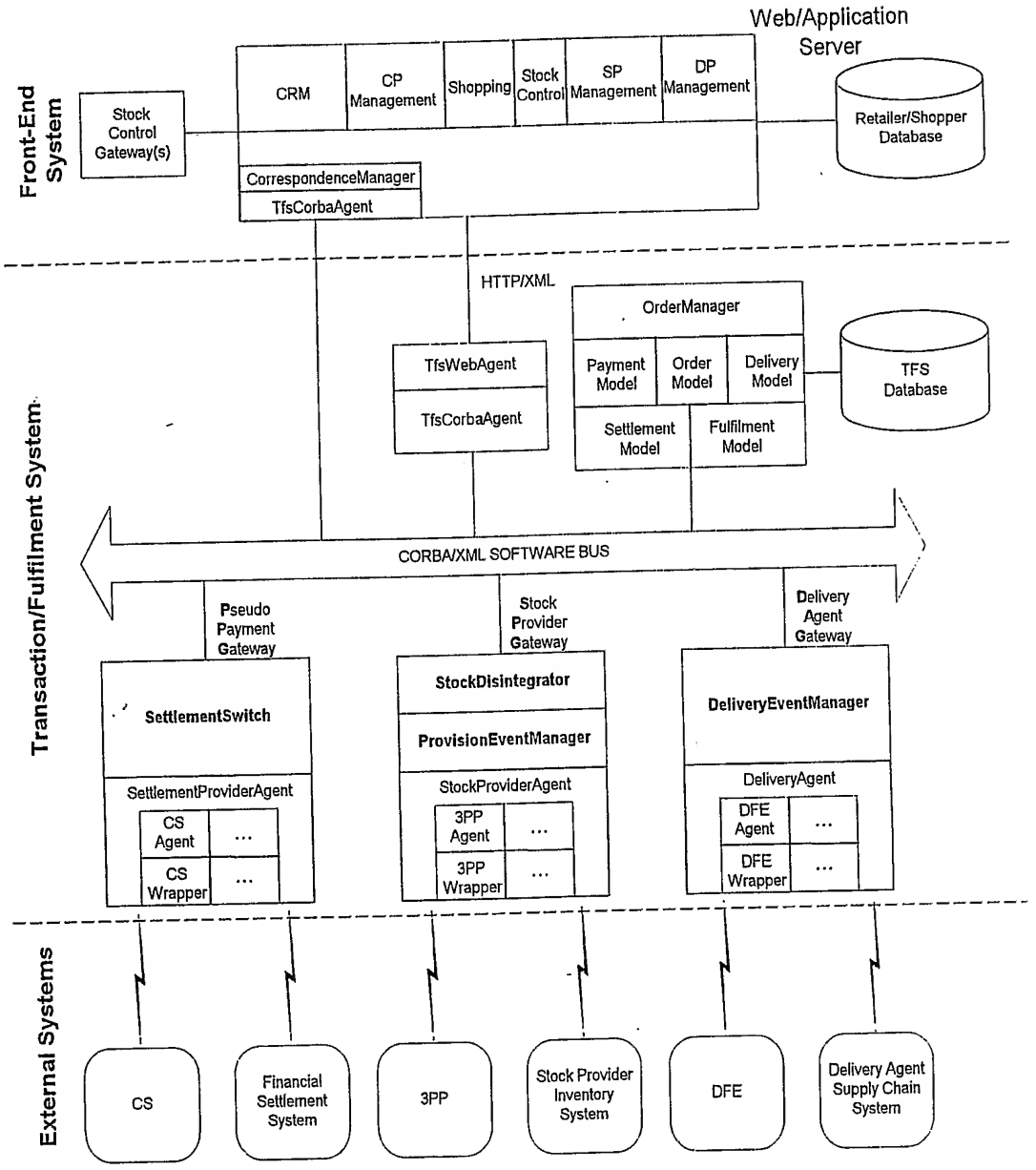
Web/Application Server
Front-End System
Stock Control Gateway(s)
CRM
CP Management
Shopping
Stock Control
SP Management
DP Management
Retailer/Shopper Database
CorrespondenceManager
TfsCorbaAgent
HTTP/XML
OrderManager
Payment Model
Order Model
Delivery Model
Settlement Model
Fulfilment Model
TFS Database
TfsWebAgent
TfsCorbaAgent
Transaction/Fulfilment System
CORBA/XML SOFTWARE BUS
Pseudo Payment Gateway
Stock Provider Gateway
Delivery Agent Gateway
SettlementSwitch
SettlementProviderAgent
CS Agent
CS Wrapper
StockDisintegrator
ProvisionEventManager
StockProviderAgent
3PP Agent
3PP Wrapper
DeliveryEventManager
DeliveryAgent
DFE Agent
DFE Wrapper
External Systems
CS
Financial Settlement System
3PP
Stock Provider Inventory System
DFE
Delivery Agent Supply Chain System

FIGURE 6

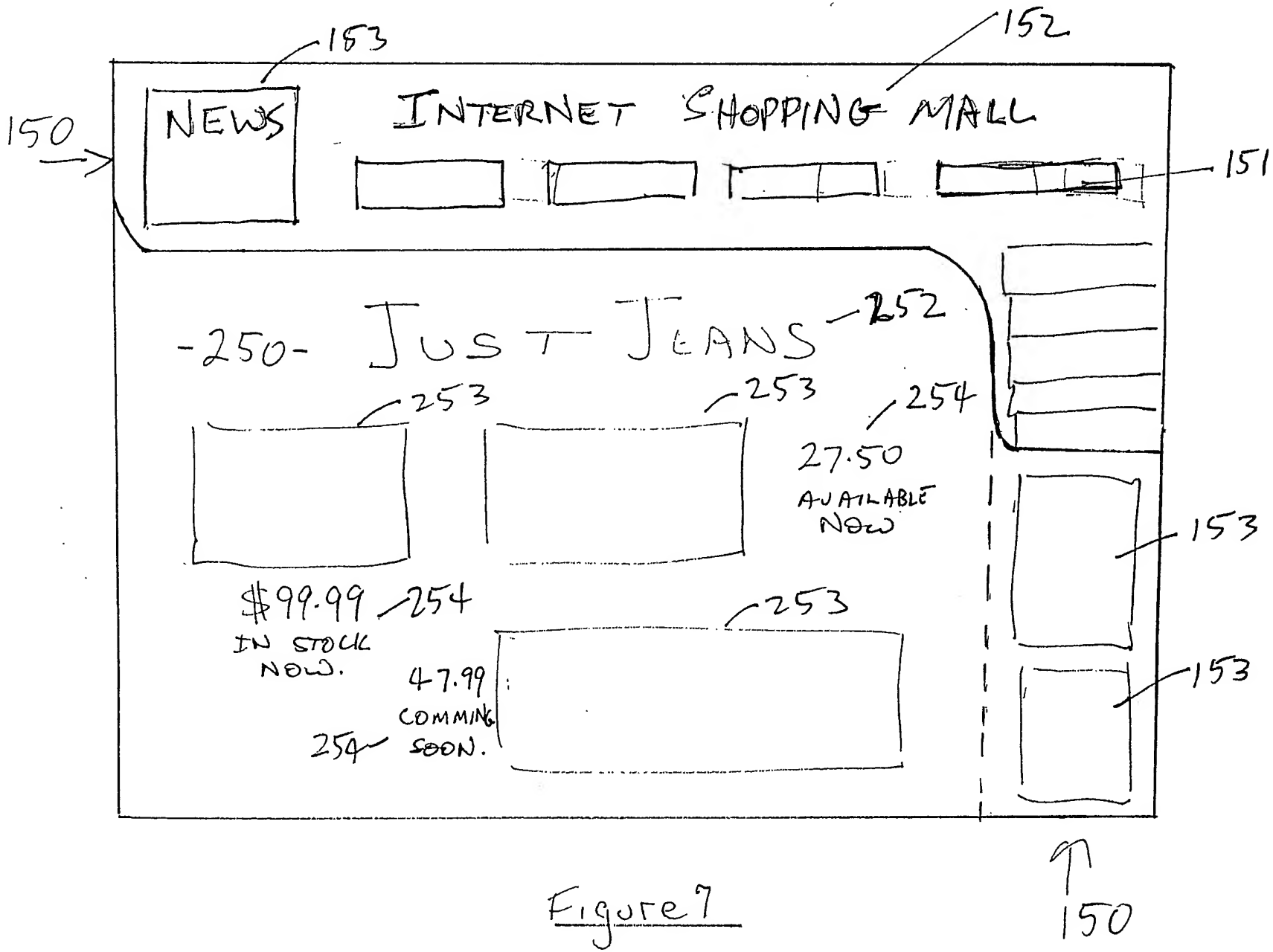
153
152
150
NEWS
INTERNET SHOPPING MALL
151
-250- JUST JEANS
252
253
253
254
27.50
AVAILABLE NOW
153
$99.99
254
IN STOCK NOW.
253
47.99
COMMING SOON.
254
153
150

Figure 7